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JULES GILBERT

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Thirty-First Annual Meeting *Toronto, June 1-3*
in conjunction with the Ontario Health Officers Association

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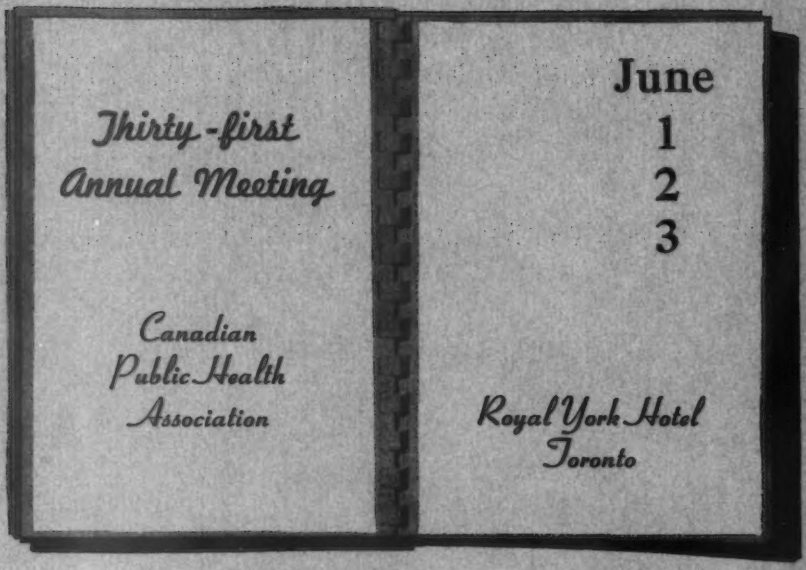

The Canadian Public Health Association announces the holding of its thirty-first annual meeting in the Royal York Hotel, Toronto, on Monday, Tuesday and Wednesday, June first, second and third, under the presidency of Dr. James J. McCann, M.P. . . . The meeting will be held in conjunction with the twenty-eighth annual conference of the Ontario Health Officers Association.

CANADIAN
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Britain's Health In Wartime*

SIR WILSON JAMESON, M.D.
Chief Medical Officer of the Ministry of Health of Great Britain

I CANNOT express to you the honour I feel in being made one of the great and distinguished family of graduates of the University of Toronto, a university with which we at home have had such intimate dealings and with which my Scotland, that little rugged country to the south of which lies England, has such a long association.

It is a great privilege that such a recent graduate as myself should be permitted to address you tonight. It is not easy for me to know just what I should say to an audience of good Canadians on such an occasion as this. We are both in the war, crusade perhaps I should call it, so whole-heartedly that much of our experience in Britain must be known to you and indeed must have been shared by many near and dear to you.

Perhaps you will permit me, however, to draw your attention to some of the outstanding happenings in relation to public health and to try to show you that even in these days of tribulation good may come out of evil, for war is a chastening process from which many salutary lessons may be learned.

Evacuation of Women and Children

First of all, let me say a word about the enormous movements of certain sections of the population from one part of the country to another. During the first eighteen months of the war over two and a quarter million mothers and children in England and Wales were transferred, under official evacuation schemes, from our big cities to smaller towns, to villages, and to the countryside, where they were in the main billeted in private houses. Many of these people have been evacuated two, three, or even four times for, as bombing

**An address given at a public meeting held in Convocation Hall, University of Toronto, on October 24, 1941, under the auspices of the Health League of Canada. On this occasion the degree of LL.D. was conferred upon Sir Wilson Jameson by the University.*

became less frequent, there was a drift of evacuees back to the towns from which they came. Well over a million of these people are still in billets. It is fortunate that our housing improvements of the last twenty years made it possible for us to absorb this army without overcrowding, and that our householders accepted this invasion of their cherished privacy with tolerance and goodwill. We have of course had and still have our difficulties, but with the aid of welfare workers and psychiatric social workers, these difficulties are being overcome and gradually the great experiment of turning the city dweller into a village resident is proving successful.

And was not such an experiment well worth all the trouble we have had? The congestion in the cities of Great Britain has been the cause of all sorts of social evils, and if we can get even a small proportion of our people to return to the land whence most of them originally came we shall have done well.

Nearly one hundred emergency maternity homes have been established up and down the country in safe areas where normal confinements have been conducted with the best possible results. Expectant mothers are billeted near these homes for a few weeks prior to their confinement, and attempts are made, not always with success, to keep the mothers and their infants in the country for some time afterwards. We hope many of these country maternity homes will remain as permanent institutions.

Then there are more than three hundred war-time residential nurseries for children under five. While no one wishes to see very young children separated from their parents for long periods of time, we think we may be able to retain many of these nurseries as convalescent homes to which children may be sent, in happier days, from our child welfare centres. So far as the value of evacuation schemes is concerned, the main argument in favour of removal of selected groups from target towns lies in the fact that the age group 5-15 years—which has contributed a much higher proportion of evacuees than any other—has shown much the lowest death rate from "enemy action."

In addition to the official schemes for the mass movement of selected persons, there has been of course a great deal of unofficial movement of people from one area to another. There has, too, been the recruitment of millions of men and women into the fighting services, many of whom have been billeted in various parts of the country. Finally, great numbers of men and women have had to be taken from their homes to work in the factories that are everywhere being developed. All these comings and goings of the people have destroyed home life. No one's home is his own: he is either living in some other person's home or sharing his own with total strangers. It requires little imagination to conjure up the possible complications of such a state of affairs, and yet we have endured two years of the war without any obvious deterioration of health—and, it is hardly necessary to add, with an increasing determination to see this business through to the end.

MEDICAL SERVICES

In order to deal promptly and efficiently with air-raid casualties and with cases of illness in the services and in evacuated persons, emergency medical,

hospital, and laboratory services had to be established. It is estimated that we have some 400,000 hospital beds in England and Wales available within the Emergency Hospital Scheme. So far as possible, additions to hospitals have been made with an eye to their future use in times of peace.

Some of our hospitals have been so damaged that they will have to be rebuilt. It would be folly to rebuild them on crowded and unnecessarily expensive sites. With modern means of transport it is possible to move patients in comfort considerable distances and I for one look forward with confidence to some redistribution of our hospitals in the years to come. It was thought necessary at first to keep large numbers of beds empty and staff standing by ready for the reception of casualties of all kinds. Experience so far has shown that we overestimated the need for such a big reserve. The result has been that these hospital beds have been used more and more for civilian sick and we are rapidly getting something in the nature of a national hospital service—without our being fully aware of the change that is taking place. As these hospitals are grouped and administered, for war-time purposes, in regions, we are coming to the belief that the proper method of providing adequate hospital services for the benefit of the public is on a big regional basis and already schemes are being discussed for future hospital provision on these lines.

We very naturally dreaded the appearance of serious epidemic disease in the unusual conditions in which people were living, and in order to assist early diagnosis we established a system, under the management of the Medical Research Council, of over thirty emergency public health laboratories covering the whole country. Some of these laboratories were new creations; others, which had been in existence for years, were brought into the scheme. As a result every medical officer of health has now a first-class laboratory within a maximum radius of thirty miles. Not only does the laboratory do all the bench work needed but the staff go out and help with the field work, and it will be a great disappointment to me if we do not retain these indispensable epidemiological units after the war.

One of our fears was that, with the inevitable damage to water mains and sewers by bombing attacks, there would be a great increase in the incidence of typhoid fever. Happily this fear has not been realized. In London, for instance, every type of water main has been broken in every conceivable manner. Sewers have emptied their contents into large trunk mains and polluted the water over great distances. One main, four feet in diameter, has been broken no fewer than eleven times, and the number of times mains have been damaged amounts to thousands. This is understandable when we recollect that the system of mains in London is over eight thousand miles in length. The disinfection of mains under repair by means of chlorine, in a strength of 10 p.p.m. and with a period of contact of fifteen minutes, has, however, proved an excellent safeguard and I am happy to say that neither in London nor elsewhere has there been any outbreak of typhoid fever due to damage to mains and sewers as a result of air-raids.

The war has helped us to make real progress with our scheme for the

immunization of children against diphtheria. Last November the Government decided to issue supplies of alum precipitated toxoid free to all health authorities and that provided the necessary official backing and stimulus for the movement. I cannot give you the figures of the numbers immunized so far—we have called for returns up to the 30th September—but we have evidence that a great deal has been accomplished in the past eight or nine months. We are finding difficulty, of course, in bringing in the children below school age in sufficiently large numbers but we hope that with continued publicity even this trouble will be overcome. And I need hardly say that we are using the amazing record of Toronto as one of the main features of our publicity campaign. The war, in fact, has given a great impetus to our health educational work, and I hope to see the Ministry itself playing a very much larger part altogether in the future than it has in the past.

AIR-RAID PRECAUTIONS

In addition to devising a hospital and laboratory system to meet our anticipated needs we had, of course, to work out a whole scheme of air-raid precautions—or as we now know it, A.R.P. This meant the creation of first-aid or stretcher parties who travel at once to the scene of what is called "an incident" and assist in finding casualties and in applying the necessary first-aid treatment. First-aid posts had to be established to which the less severely injured are directed. Ambulance services had to be built up, air-raid shelters had to be provided, and cleansing centres for decontaminating persons affected by mustard gas had to be planned. In addition rest-centres for bombed-out persons had to be found and equipped. There are now some 13,000 of these in Great Britain with accommodation for over a million people. A large staff had to be assembled and trained and retrained in the light of new knowledge and experience, and in all of this the medical officer of health was heavily involved. Indeed, it is this work that has occupied by far the greater part of his time in certain areas.

The air-raid shelter problem has been one of no little difficulty. Domestic shelters and street surface shelters had been prepared against the onset of daylight raids but when night bombing began a year ago the public took the law into their own hands and invaded deep tube stations and other underground spaces where they felt themselves to be in greater security. These places had not been prepared as dormitories and sanitary and other arrangements were sadly lacking. Soon, however, provision was made for proper equipment and supervision. Large numbers of shelters have been fitted with bunks; water-flushed toilets have been installed where possible; medical aid posts have been established in all large shelters, with doctors and nurses in attendance—incidentally much health education work is carried on and many children have been immunized against diphtheria in these shelters; canteens are available and entertainment provided.

And now it is right to say that reasonable shelter provision has been made for a very large mass of the people. For example, by last April the

total capacity of public and domestic shelters in the county of London amounted to two and a half million persons. A census taken on the 7th of April, when rains were fairly heavy, showed that some 23 per cent of the people spent the night in either public shelters or privately provided domestic shelters—about 8 per cent being in public shelters including the deep tube stations. The rest of the people just stayed in their own homes or else used shelters provided by private means. It is of interest that we have had no epidemic disease associated in particular with shelter users nor has the incidence of vermin among such persons increased.

INDUSTRIAL HYGIENE

So far this war has been for us a war in which industrial workers have played an almost larger part than the members of the fighting services. It is fitting therefore that I should say something of the conditions under which industry is being carried on and of the health of the persons employed. One of the penalties of a democracy appears to be that it takes a long time to get into its proper stride. This was so in Great Britain but the pace has been steadily increased and a gigantic effort is now being made. There have been many difficulties to overcome. New factories have had to be built, often in remote parts of the country. Workers have had to be drafted to them and living accommodation found or provided for them in the neighbourhood or special means of transport to and from their homes arranged. Many workers have joined the services, so new entrants to industry have had to be trained and women in large numbers are taking the place of men. All factories have to be blacked out as a precautionary measure against air raids; this raises problems of lighting and ventilation. Bombing attacks may be made while people are going to and from their work. Shopping for the family becomes very difficult when the women-folk are employed in factories. Young children must be cared for while the mothers are at work, so war-time day nurseries are being everywhere established. Special arrangements have to be made for medical care and welfare work in the new factory areas. After the evacuation of Dunkirk and the collapse of France in May, 1940, a tremendous effort was put forth by industry. Longer and longer hours were worked and it is interesting to record that in many factories there was actually a higher hourly output of work at the same time. This, however, as we knew from experience, could not last and gradually output began to fall as a result of strain and fatigue. Time began to be lost through sickness and injury and workers became stale. Had the long hours continued there would undoubtedly have been a serious effect on health and efficiency, so a reduction of hours was introduced and some provision was made for holidays. It is true to say that there is little to gain and probably more to lose when the weekly hours of work exceed 60-65 for men and 55-60 for women. In spite of what our people have been through I am glad to have the assurance of the Senior Medical Inspector of Factories that he finds no evidence that in general the health of the industrial worker has suffered materially.

In order to safeguard the health of factory workers the Minister of Labour has issued an order making compulsory, when thought necessary, medical supervision and nursing and welfare services in any factory concerned with the manufacture of munitions of war. In consequence well over one hundred full-time and nearly four hundred part-time doctors have been appointed to munition factories as well as very large numbers of nurses. Welfare work, too, is spreading rapidly both within factories and in the districts surrounding them. It is satisfactory that factory owners who originally accepted such supervision with great reluctance have later expressed their appreciation of its practical value. We hope this increase in medical care and in welfare work in factories will become a permanent part of our industrial organization.

MENTAL HEALTH

You may ask how the civil population have stood up to the frightfulness they have had to endure. I may say right away that their spirit has been splendid and that, if anything, the women are even stouter-hearted than the men. I could say a lot about that if I had time! As regards neurotic illnesses, here are the conclusions reached in a quite recent report to the Medical Research Council:

"Air raids have not been responsible for any striking increase in neurotic illness. Crude figures from hospitals and outpatient clinics even suggest a considerable drop.

"The incidence of neurotic illness has been low in fire-fighters and other workers in civil defence.

"Insanity has not increased, so far as figures are to hand.

"Suicide has diminished both in England and in Scotland.

"It is impossible to distinguish between neurotic illness due directly to air raids and that which may follow such secondary troubles as disruption and loss of one's home, evacuation, difficulties in transport to and from work, or temporary loss of employment. It is to the war as a whole, with its accumulated stresses, that people have had to adjust themselves, and signs of failure to do this can be taken as warning signals of neurosis. An increase in alcoholism would be such a sign: there is no evidence that there has been any increase of this sort."

NUTRITION

And now a few words about rationing and how the people are faring in spite of some food restrictions. Only certain foods are rationed; these are meat (25 cents' worth a week), bacon, butter, margarine, lard or cooking fats, cheese, tea, sugar and jam. We have to register for milk and certain categories of the population are given priorities for milk, viz., expectant and nursing mothers and children up to the age of eighteen. Adults get what is left over, while persons suffering from certain kinds of illness have special privileges. Under the National Milk Scheme mothers and children under five may obtain a pint of milk a day at the postwar price of twopence, or three cents; if need be, free. School children, under the Milk in Schools Scheme, may

purchase, or be given without charge, in school, two-thirds of a pint daily at a cost of ½d (less than one cent) for one-third of a pint. During this year more than three million persons have benefited under the National Milk Scheme, while two and three-quarter million children are getting milk under the Milk in Schools Scheme. It is a very large proportion of the population.

A national wheatmeal loaf, made from 85 per cent extraction flour, is marketed at the same price as white bread and the medical profession has always urged that it should be made the standard issue for the country. It has, however, been decided as a matter of policy that both types of loaf should be available but that white flour should be enriched by the addition of thiamin. Vitamins A and D are added to all margarine. I have been extremely interested since coming to Canada to learn that there are now ways and means of milling an extremely satisfactory flour just as good as a high extraction flour, which contains a very high proportion of the vital elements, and I hope to take that information to England with me.

The conclusion is that for a beleaguered citadel we are being very well fed indeed, very largely on account of the efforts that have been made by our good friends and relatives in the Dominions and in the United States of America, who have seen to it that food has reached our country. But we have considerable difficulty in the distribution of foodstuffs. In some districts shopping is a much more troublesome business than in others. But sufficient food is either being produced in Great Britain or is being brought into the country to keep us all in good heart and fit for a pretty heavy day's work. We think the best way of overcoming distribution difficulties is by extending communal feeding. One of our aims is to provide as many children as possible with a mid-day meal in school; I believe this will become a permanent part of our educational program. At present about six per cent of our school children are having a school dinner. The numbers are increasing rapidly and we hope during this winter to feed many more.

Canteens for factory workers, miners, dockworkers, and building operatives are springing up everywhere. Nearly all the factories in which we can require the establishment of canteens serving hot meals have already made, or will shortly have made, such provision. British restaurants, financed by the Government, where the whole family may get a good meal at a cheap rate, already number over 1,000 and another 400 will soon be opened.

All of these arrangements tend to make possible the eating of one square meal a day and enable the women of a household to enter industry without the worry of knowing how their families are to be fed. Of course, it is not easy to get together the equipment needed for communal feeding on such a vast scale, but it is being done with all possible speed. The old idea that an Englishman's house was his castle behind the walls of which he secured himself against all comers is no longer true. He has to share his castle with any person who may be officially billeted on him and, more than that, he may no longer eat his roast beef before his own fireside. If he wants a good meal at a cost within his means he may have to collect his bowler hat and umbrella

and betake himself to some communal feeding centre. We are becoming a very different people from the race continental caricaturists poked fun at for so many years.

Up to the present I think I can say that with the means at our disposal we have not been able to find evidence that our people are suffering in any degree from malnutrition. I should be foolish, very foolish, however, to feel easy in my mind as to the future. The margin of safety we possess must be very small, and in particular I am concerned about the young adult group, the 15 to 20's, and about the workers in heavy industry.

I should also like to support what Dr. Parran said in relation to nutrition—the international point of view regarding nutrition as a permanent part of our reconstruction effort after the war. I believe that nutrition, after the war, in relation to all these occupied and distressed countries, is going to be one of the most important things to which we ought to give consideration, and it ought to be given now.

Now to keep all these war-time activities moving and to maintain existing services at as high a pitch of efficiency as possible has made enormous demands on our trained man power—and nowhere more than in the case of doctors, dentists, nurses, and other officials of our health and medical departments. We have had endless difficulties over doctors and at the present moment we have a committee of well-known medical men drawn from civil practice and from the services actively engaged in trying to secure a better utilization of our diminishing resources. Indeed, members of the committee are travelling about the country in an endeavour to see for themselves whether service and civilian needs cannot be pooled and dealt with by a single medical staff, and whether reductions in what are considered minimum establishments cannot still be made. It is no easy matter to provide medical officers for our fighting services and for all the special kinds of work connected with first aid, shelters, emergency hospitals and the like thrown up by the war—in addition to retaining enough doctors to care for the civil population. Large numbers of women are joining the Civil Nursing Reserve and being given some training in nursing, but the competition of the uniformed women's services and of industry is very strong. Casualty work, of course, has its slack as well as its busy periods, and it is hard to determine what is exactly the insurance we should provide in the way of trained personnel standing by to meet any sudden emergency.

On the whole, then, our health services have stood up well to the additional tasks placed upon them. Normal services have continued to function. Infectious disease during the war, fortunately, has been no more than average. We must, however, keep always in mind the possibility that we may be living on the resources we have built up over a period of years. The increase in the incidence of tuberculosis, with the heaviest mortality falling on the female age group 15-25, gives us concern and we are trying to determine the possible causes of this increase. We must ever be on the watch for these unfavourable trends.

We may have been slow to realize that war in Europe was inevitable and slow to appreciate the magnitude of the issues even once the battle had been

joined. There is now no misunderstanding of the situation. Every man and every woman knows that if this war is to be won it can be won only by each one's putting forth the greatest effort of which he is capable. This is what we are approaching now. Those of us who are in some measure responsible for the planning of things are constantly looking to the future and endeavouring so to meet the present emergency as to derive some permanent good from the measures we adopt. For war, though a great destroyer of things worth preserving, may yet almost overnight open the door to progress and reform that in peace-time would have meant years of constant striving.

THIRTY-FIRST ANNUAL MEETING
CANADIAN PUBLIC HEALTH ASSOCIATION

TWENTY-EIGHTH ANNUAL CONFERENCE
ONTARIO HEALTH OFFICERS ASSOCIATION

ROYAL YORK HOTEL, TORONTO

JUNE 1-3, 1942

The Development of the Municipal Health Department and the Provision of Health Districts in the City of Montreal*

ADELARD GROULX, M.D., M.P.H., F.R.S.I.(E.)
Director of the Department of Health
Montreal, Quebec

IN choosing a subject, I have considered it my duty to speak to you of the development and new departures in public health in Montreal, the principal city in the Province and the metropolis of Canada.

I think that the best way of showing you the progress made in this city is to let you compare the general mortality rate, the infant mortality rate, and the number of deaths from tuberculosis in 1900 and in 1940:

	1900	1940	Proportion of decrease
General mortality: rate per 1,000 population.....	25.46	10.25	59.7
Infant mortality: rate per 1,000 births.....	301.05	59.3	80.3
Deaths from tuberculosis: rate per 100,000.....	239.79	64.1	73.2

The 1900 rates were very high but great progress has been made in the past thirty years. We should give credit to the industriousness, the devotedness, the initiative, and the energetic action of my predecessor, Dr. S. Boucher, who placed the Department of Health of Montreal on the well-organized basis in which I found it when I was called to succeed him in 1937.

We have continued the work by seeking to direct the department along the lines of modern public health practice and by following the example of other large cities which have organized "sanitary districts," organizations which facilitate and bring speedy solution to certain difficult problems.

Public health, in its modern concept, dates from about a century ago and had its origin in England. Pasteur's and Koch's discoveries gave a new direction to medicine, and public health had to take this into account. The high cost of the preventive measures, including vaccines, obliged public bodies to facilitate access to preventive measures which had been found effective and place them within reach of all. In Montreal the first step in this direction was vaccination against smallpox after the great epidemic of 1885. Later, immunization against diphtheria was offered to the public without charge. The organization and maintenance of baby clinics provided certain facilities for the prevention and treatment of gastro-enteritis which was, early in this century, the chief cause of death in early infancy. The considerable number of physical defects discovered by medical examination of pupils in schools showed the need for special clinics to look after these children. In the fight against tuberculosis dispensaries were opened to facilitate early diagnosis and sanatoria were founded. Control over venereal diseases is a very serious

*Presented at the thirtieth annual meeting of the Canadian Public Health Association, held in the City of Quebec June 9-11, 1941.

problem and it is recognized that effective treatment is very expensive and that public clinics must be maintained to treat these maladies.

Public health has as its objective the improvement of the health of the public and the prevention of disease. It is concerned with the whole community. To attain its objective it must be organized so as to reach the various groups making up society. When a program of public health is to be initiated, it is necessary to break up the organization and to establish sections the direction of which is entrusted to trained public health specialists who work under the direct control of the head of the department. The fundamental sections of a well-organized department are as follows:

1. Administration.
2. Vital statistics and demography.
3. Control of contagious diseases and epidemiology, to which may be added sub-sections dealing with tuberculosis and venereal diseases so that these scourges may be combated with more energy.
4. Child hygiene, which includes all problems relating to the child, including mental hygiene, dental hygiene, and nutrition.
5. Food control.
6. Industrial hygiene.
7. Laboratory services.
8. Public health education.

In Canada, and in the Province of Quebec, the duty of municipalities and of their health departments, according to our public health laws, consists of eliminating noxious conditions, controlling contagious diseases, and applying the laws and regulations relative thereto. The other usual functions of a health department, which are not imposed by law, are the natural concomitants to the normal development of public health.

THE DEVELOPMENT OF PUBLIC HEALTH IN MONTREAL

The development of the Department of Health of Montreal proceeded slowly. Prior to 1869 all matters pertaining to public health in the city were in the hands of a board of health which was responsible to the authority of municipal police and health committees. In 1876 the board of health was organized on a different basis and on December 21st By-law No. 105, with this end in view, was adopted. This was the legal beginning of the permanent status of Montreal's Department of Health. At that time it seems that the activities of the Department were limited to sanitation, with an incipient effort to control contagious diseases.

The Department of Health saw a greater expansion in 1918, when it was reorganized and eight divisions which have become the basis of the present set-up were established. Following a survey it was further improved in 1928. Since that time it has witnessed rapid development in accordance with modern ideas of public health and our widening knowledge concerning sickness and its prevention. The present organization of the Department is shown in figure 1.

Sanitation

Sanitation originally was the most important activity of the Department. The first sanitary engineer was appointed in 1892. Now the field of action

of the sanitation branch is divided into two sections: the division of sanitation, created in 1908, which comprises three sub-divisions, building and plumbing, sanitary inspection and records, and the application of special by-laws; and the division of food control, which was established in 1912. This division was reorganized recently and now is composed of three sections, responsible, respectively, for the inspection of milk and pasteurization plants in the city and in the country, where production is supervised; the inspection of meat in inspection depots, abattoirs, and butchers' stalls; and the inspection of grocery stores, restaurants, and bakeries.

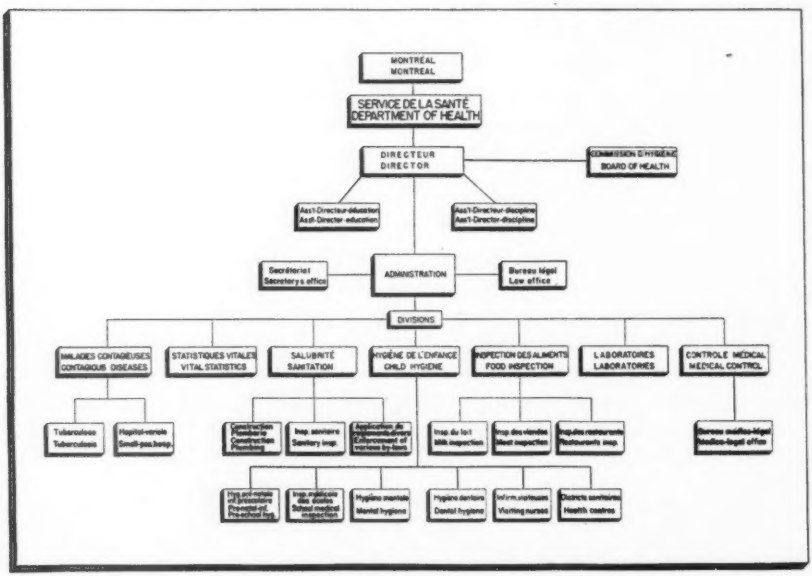

FIGURE I

THE ORGANIZATION OF THE DEPARTMENT OF HEALTH OF MONTREAL

The medical examination of all food handlers, hairdressers, masseurs, and barbers is obligatory and is under the supervision of the medical control division, which also looks after vaccination in plants. Recently X-ray examination of milk handlers was introduced.

Among the measures of general sanitation which have been put into effect and which have greatly influenced the fight against typhoid fever, tuberculosis, and intestinal infections of childhood, we must mention the provision of a pure water supply (1912-1915) and of a safe milk supply through inspection (inaugurated in 1887) and the regulation and pasteurization of milk (1925).

Communicable Disease Control

The division of contagious diseases seems to have had its inception in 1901 but it can be considered as having been effectively organized since 1905.

One of the first fights to have been waged was that against smallpox, in 1885, when vaccination was made compulsory. The result has been that smallpox disappeared in Montreal: there has not been a single death since 1918 and not one case since 1930.

The average number of deaths from typhoid fever during the past ten years has been 201, as compared with 123 deaths for the decade 1901-1910 when the population was smaller. There has been, therefore, an appreciable decrease.

There have been two epidemics of poliomyelitis, one in 1907 and another in 1931. In 1938, in view of a possible epidemic, a plan of campaign was prepared in order to meet any eventuality and the Department of Health purchased ten pulmotors which were placed in the city hospitals.

The fight against tuberculosis has taken on important proportions in recent years. In 1938 the Department organized a tuberculosis section to correlate the work of the anti-tuberculosis organizations in the city and to intensify the campaign for the control of this disease. A central record system was established, the free distribution of tuberculin was undertaken, and tuberculin tests were provided in schools and clinics. In February 1940 a radiology clinic was opened to assist the family physician in diagnosis. The Department has also taken an active part in the educational campaign undertaken by the Provincial Committee for the Prevention of Tuberculosis. As a result of these efforts, the mortality from tuberculosis in Montreal reached its lowest rate in 1940, 64.1 per 100,000 population.

The mortality from diphtheria was reduced to 1.2 per 100,000 population in 1940, the result of an immunization campaign which has been conducted continuously since 1928. Nearly 200,000 children have been immunized. In order to give an impetus to this work, the Department of Health held this year, in co-operation with the Health League of Canada, an "immunization week" which had most encouraging results.

Since 1923 there has been a movement afoot to encourage the free distribution of serum; this was first undertaken in 1926.

The division of laboratories plays an important part in the discovering of communicable diseases; it is first of all a "diagnosing department" for making chemical and bacteriological tests. In addition to clinical analyses, the laboratory conducts chemical and bacteriological tests of milk, water, and food.

Vital statistics have been compiled since the origin of the health department in 1872, and the system has been extended and improved. Recently, in order to obtain more complete figures dealing with marriages, births, and deaths, the Minister of Health allowed us certain powers; and it has been possible to realize a plan for centralization of the collection of statistics. All the statistical reports (marriages, births, and deaths) made out by the clergymen in the metropolitan district of Montreal are collected by the Department.

Child Hygiene

The organization of the child hygiene division in 1918 followed a study of infant mortality and the reorganization of medical school inspection.

In 1900 the death rate among infants under one year of age was 301.05 per 1,000 living births. In 1940 the rate was 59.2 and in the same year the maternal mortality rate was 3.07 per 1,000 births.

Among the measures which have contributed to the lowering of these rates, let us mention the baby clinics which were inaugurated in 1901 and 1903. The establishment of civic clinics, which now number forty-eight, dates from 1919. The saving of babies' lives and the education of mothers are now assured in Montreal through the provision of seventy-six baby clinics which are controlled by three organizations: the Department of Health, which operates the forty-eight civic clinics; the Child Welfare Association, which operates nine centres; and the "Féderation d'hygiène infantile," which was formed in 1910 and has nineteen clinics. A number of prenatal clinics were established by the Department in 1920. Since 1912 this work has been carried out through the "mothers' aid" and the hospital maternity clinics.

Other important measures which the Department has taken in the campaign to reduce the deaths of infancy and early childhood include the opening of day nurseries in public parks in 1925; the inspection of children's boarding houses and private maternal hospitals, which has been conducted since 1916 by authority of special by-laws; the notification and registration of births as soon as possible; and visits of nurses to homes.

Medical inspection in schools was originated in Montreal in 1906 but it was not until 1910 that it was put on a permanent basis. The employment of visiting nurses, however, goes back to 1908. Originally part of the contagious diseases division, medical inspection in schools became part of the child hygiene division on its establishment in 1918. In 1928 the division was reorganized and the staff increased; and since that time its work has been greatly extended and diversified. Medical inspection is now being conducted efficiently in three hundred and two schools as the result of an agreement entered into with the Montreal school authorities.

The present program of the school inspection branch is now practically complete. It includes: teaching of public health, sanitary supervision in schools, control of contagious diseases, discovery and correction of physical defects by periodical and routine examinations, dental examinations, inspections and addresses, annual inspection of institutions, hearing tests with the audiometer, psychometric test (Binet-Simon) to classify children mentally retarded, immunization against diphtheria, and discovery of contact cases of tuberculosis by the use of the patch (Vollmer) test. House-to-house visits are made by nurses with a view to educating parents. In addition to ascertaining cases of infection or contagion, they emphasize the importance of having the children treated.

Municipal dental clinics, including an orthodontia clinic, have been in operation since 1932 for the benefit of pupils whose parents cannot afford the necessary treatment. All this dental work was united in one special section organized in 1939.

THE PROVISION OF SANITARY DISTRICTS

The decentralizing of services by the forming of sanitary districts has tended to become more and more general among health departments in our large cities. This new departure in the municipal sanitary domain has become imperative due to the ever-increasing complexity of public health administration in large centres. When a sanitary district was inaugurated in Baltimore, Dr. Williams, Commissioner of Health of that city, stated: "It would logically seem quite as necessary for a large city health department to decentralize its services in this manner as for a fire or police department to have district stations in order to render more speedy and efficient neighbourhood service." Moreover, the development of sanitary districts has resulted from recent improvements in public health and education, following the formation of various health organizations, the extension given to the work of visiting nurses, clinics, etc.

The sanitation problems of a city vary according to the sections which compose it and the population inhabiting it. Measures to be taken are not the same in every case and must vary in proportion to the requirements of the ethnical character of the population, its particular problems and their nature. Thus, in one section there will predominate the fight against tuberculosis, in another infant mortality will be more acute.

There is therefore an advantage, I believe, for a large city, from the point of view of general administration, efficiency and the satisfaction due the public, in dividing the territory into a certain number of districts called "sanitary districts."

In this division must be taken into account the electoral districts, parishes, various nationalities, etc. This distribution also brings up complicated problems in a cosmopolitan city. On the other hand, the distribution into electoral divisions is not an ideal one, because of the political changes which may be made, as has occurred in Montreal recently.

End to be Attained

The organization of sanitary districts has a double purpose: first, to render more effective service by making it more accessible to all, and, second, to discover the local needs.

It also has the purpose of attracting public attention, of developing civic spirit by educating citizens to be more interested in public health. It will be the duty and one of the chief functions of the district head to establish such relations, to enable the public to understand them better, and even to establish, if needed, to further these ends, citizens' committees.

As we explained in the course of an address last year at Winnipeg, the object of sanitary districts is to procure decentralization of services, more intimate contact with the public, fuller investigation of local problems of health, and more effective control over infant mortality, maternal deaths and those caused by tuberculosis or other contagious diseases. The sanitary district should also be a centre of co-ordination assuring closer co-operation-

with the doctors and the various social organizations for the purpose of obtaining better results.

Organization in Montreal

There are now three organized districts in Montreal. Two others are in the course of being formed, one of which has already begun to operate chiefly for the purpose of facilitating control of communicable diseases.

This organization is not altogether new for us, as distribution of school inspection by districts already existed for visiting nurses. From the point of view of sanitation and various kinds of inspections the city was also divided into districts.

The organization of sanitary districts has been entrusted to the staff of the child hygiene division, of which it becomes a section and upon which the greater number of activities depend; the assistant superintendent of this division has the special duty of looking after this organization.

The plan which we have in view, as shown in figure 2, includes the division of the territory of the City of Montreal into eight sanitary districts, each under the direct control of a doctor who is "district head," and who holds a

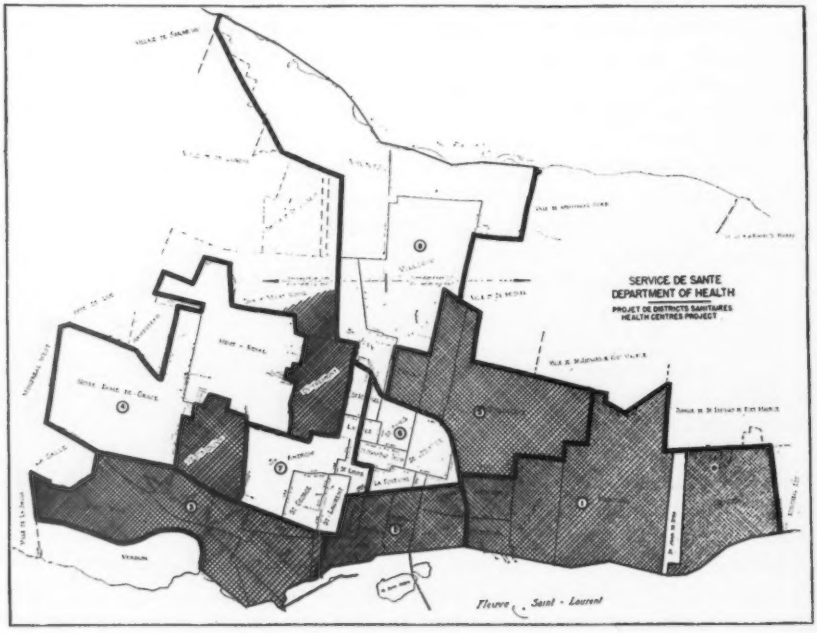

FIGURE II

PROJECTED SANITARY DISTRICTS FOR THE CITY OF MONTREAL

Centres have already been organized for District No. 1 (Maisonneuve), No. 2 (St. James), No. 3 (South-West), No. 4 (Rosemount), and No. 5 (Notre Dame de Grace).

degree in public health as well as having had a few years of training in our department.

The first sanitary district, "Maisonneuve," was organized in November, 1939; it includes the eastern part of the city. Later we organized District No. 2, St. James, which includes "Old Montreal." Montreal University and the Dental Faculty are contained therein. During 1940 District No. 3 was opened in the southwestern section of the city. Two others are in the course of formation, one in Rosemount, in the northeast of the city, the other in the west end, including Notre Dame de Grace and Mount Royal wards.

Each district serves a population varying between 100,000 and 130,000 inhabitants, as is shown in table I, which gives vital statistics for these five districts for 1940.

TABLE I

POPULATION AND BIRTH AND DEATH RATES IN THE HEALTH DISTRICTS OF MONTREAL, 1940

	Sanitary Districts				
	No. 1 Maisonneuve	*No. 2 St. James*	*No. 3 South-west*	*No. 4 Rosemount*	*No. 5 N. D. G.*
Area (acres)	6,047	1,558	3,200	3,295	5,331
Population	102,100	126,900	129,950	108,125	78,800
Schools	39	40	55	26	24
Births—rate per 1,000 pop.	22.93	19.94	20.79	22.36	13.98
General death rate—per 1,000 pop.	8.97	11.95	10.45	7.83	7.36
Infant mortality—per 1,000 births	51.70	74.67	68.8	42.40	27.22
Deaths from tuberculosis—rate per 100,000 pop.	80.98	89.80	62.3	46.24	27.91

The doctor who is in charge of the district is the representative of the Director of the Department of Health in the territory of the city entrusted to him. He is responsible to the Director not only in his work but also for that of the nurse who is in charge of the group of nurses and of the visiting nurses in this district. He is also responsible for all matters pertaining to the sanitary condition of this section of the city and for the proper carrying out of the program of the Department of Health, drawn up for the whole city according to the requirements. He must be able to ascertain what steps to take in order to solve the problems of health which are likely to present themselves in this district.

The staff of a city district, in addition to the head of the district, includes a certain number of inspecting physicians, working whole-time, and doctors on part-time duty in clinics; a nurse in charge of her group, who directs and supervises a certain number of visiting nurses, on full-time, their number varying in proportion to the needs of the district; a dental inspector for the schools, a dentist and a nurse in the dental clinic, an office employee, etc.

This entire staff is under the immediate jurisdiction of the head of the district, reports directly to him, and communicates all details of their work to him. He is responsible for their discipline as well as for their work.

The staff of the existing districts is distributed as follows:

TABLE II

PERSONNEL OF THE HEALTH DISTRICTS OF MONTREAL

	SANITARY DISTRICTS				
	No. 1 Maisonneuve	*No. 2 St. James*	*No. 3 South-west*	*No. 4 Rosemount*	*No. 5 N. D. G.*
Doctor—District head	1	1	1	1	1
Inspecting physicians	2	2	2	2	2
Psychiatrist	1	1	1	1	—
Dentist	1	2	1	—	—
Orthodontist	—	1	—	—	—
Head nurse	1	1	1	1	1
Visiting nurses	15	12	17	12	6
Psychological nurses	1	1	2	1	1
Nurses, dental clinics	—	1	1	—	—
Assistant nurses, dental clinics	1	—	1	—	—
Technician in orthodontia	—	1	—	—	—
Clerks	1	1	1	1	1
Total	24	24	28	19	12

It is important also to define the relations between the staff of these districts and the various heads of divisions who become advisers and who still remain responsible to the Director for the putting into effect of the program of activities with which they are entrusted. The superintendent of the division of contagious diseases bears the responsibility for controlling communicable diseases and epidemics. The superintendent of child hygiene must see that the plan of campaign against infant mortality, for example, is carried out; he must not lose sight of the methods used in the welfare centres for feeding of children, he must be informed as to how the medical inspection of schools, mental hygiene, etc., are carried out in the various sanitary districts. The head of the dental hygiene section must see that municipal dental clinics operate properly and on a uniform basis, that school inspection of teeth is well done, etc.

The most delicate question is probably that of establishing the proper relations in the matter of nursing and this is indeed a problem which must be tactfully handled. In a recent letter, Dr. Huntington Williams, Medical Officer of Health of Baltimore, wrote to me on this subject:

"It is my feeling that probably the only way that district health administration in a big city health department can be made to function smoothly is to have what Dr. Harry Mustard, in our Eastern Health District from 1932-37, always referred to and insisted upon—a very narrow bottle-neck passage through which all administrative procedures must channel from the desk of the Director of the City Health Department to the desk of the District Medical Officer, for all administrative relationships between the central Health Department to the desk of the District Medical Officer, for all administrative relationships between the central Health Department offices and the district office.

"The head nurse should not endeavour to control or supervise the

activities of the field nurses who have been assigned to the district supervising nurse other than in matters of general city-wide policy which may be the functions of the Bureau of Public Health Nursing."

Administrative Services

The administrative services of a sanitary district in a city may be summed up as follows, as I mentioned in a previous report:

1. The office and department of demography; keeping of records and files, statistical tables, etc.; compilation of the work and various district activities.

2. Operation of pre-natal clinics, baby and pre-school clinics, those for mental hygiene, and dental clinics.

3. Operation of medical inspection in schools and of its varied sections and special functions.

4. Control of contagious diseases:
   (a) Through investigations in schools and in homes by doctors and nurses of the district—supplementing the work of the central office where the reporting of cases and diagnosis are centralized.
   (b) Through vaccination against smallpox and immunization against diphtheria in schools and by doctors in their offices.
   (c) Through application of necessary measures to follow the development of contagious diseases in the district: cards, tables, statistics, etc.

5. Control of tuberculosis is assured through:
   (a) Visits to the homes of declared and contact cases;
   (b) Collaboration with established clinics;
   (c) Tuberculin tests in clinics and schools and visits to those showing a positive reaction.

6. "Generalized service" on the part of the visiting nurses and visits to the homes.

Heath Centres

In each of our districts there is an administration centre which is called the "health centre"; it includes the general offices of the district, office of the doctor in charge of the district, and that of his staff, and meeting room for the district visiting nurses. There should be room, also, for the various clinics—pre-natal, baby, pre-school, dental, mental hygiene, etc.

A number of other less important centres located in the same district may also be used for various clinics, officially or semi-officially.

In every important health centre there may be a small auditorium and offices for teaching public health and for the use of the various semi-official adjuncts to social work in the district.

The health centre should occupy a position—an eminent and chosen one—in a city, alongside the church and the school; it should be as well recognized

as are the police and fire stations, etc. Certain cities have adopted this principle and in New York and Boston, for example, we see magnificent "centres" erected for the purpose. Some of these have been assisted by gifts from philanthropists. Thus was founded Meurling Refuge in Montreal. Why should we not secure health centres in the same manner, through gifts to the public authorities for such laudable purposes?

Two health centres in Montreal have been located in private premises leased for the purpose and the three others are to be in municipal buildings where space has been reserved for them.

The cost of such centres is very reasonable: it consists only in the amount of the rent, in the case of the first two centres, and in the cost of maintenance. For their installation there are the expenses of proper equipment and furnishings.

Advantages

Among the advantages which can result from this new organization, I summarize the following, mentioned by H. S. Mustard:

1. To procure regional improvement in the administration of public health;
2. To furnish a field of activity in which modern methods may be tried out under strict supervision;
3. To furnish a better training-ground for the preparation of an inexperienced staff;
4. To permit of continued study of public health problems;
5. To furnish opportunities for ascertaining which are the best methods for co-ordinating work of independent voluntary organizations: hospitals, dispensaries, etc.

The sanitary district can also, as is done in New York and Baltimore, be used for practical university training and to provide field work for students in the medical and public health courses. This can be accomplished in a spirit of co-operation between the health department and the medical faculties of the universities. In Montreal two districts might be utilized for this purpose, their choice and use to be decided by agreement with the University of Montreal and McGill University.

Another advantage of the district is that it encourages "generalized service" by the visiting nurse by making possible "better supervision of the family—the primary cell in the social tissue." Thus can be avoided duplication of visits to the home, etc.

The organization of sanitary districts in Montreal is still in the experimental stage and its field of activity is still limited to the medical aspects of the department. But already this new organization shows its potential value from the point of view of speedy and efficacious control of contagious diseases. In the districts so far organized there have been no complaints for any reason whatsoever. Tracing of cases is well done, it is speedy, and

control measures suffer less delay. The public is becoming educated to give its collaboration.

I bring this address to a close by quoting this reflection by a former President of the United States, Herbert Hoover, taken from his inaugural address:

"In public health the discoveries of science have opened a new era. Many sections of our country and many groups of our citizens suffer from diseases the eradication of which are mere matters of administration and moderate expenditure.

"Public health service should be as fully organized and as universally incorporated in our governmental system as is public education. The returns are a thousand-fold in economic benefits and infinitely more in reduction of suffering and promotion of human happiness."

THIRTY-FIRST ANNUAL MEETING
CANADIAN PUBLIC HEALTH ASSOCIATION

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ROYAL YORK HOTEL, TORONTO
JUNE 1-3, 1942

Studies on Influenza: Antibody Level: Isolation of Virus

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THE work of Horsfall and his associates strongly suggests that there is a distinct correlation between antibody level and susceptibility to influenza A, that the antibody level and therefore the immunity may be raised to an adequate extent by the use of a complex vaccine, and also that in recent epidemics of influenza a diversity of aetiological agents have been responsible. This paper is a record of studies carried out along parallel lines amongst an urban population living, for the most part, in the City of Toronto, although some observations have been carried out with material from Vancouver and Ottawa.

Methods

Collection of Nasopharyngeal Washings

The patients were asked to gargle 10 cc. of physiological solution and eject it into a screw-capped bottle for transport to the laboratory. Arrived there, 3 cc. of broth was added. The washings were then transferred to test tubes in which they were kept frozen solid in thermos pots filled with CO_2 snow. The material from Vancouver was taken in the same way, half the volume of glycerine was added and they were then placed in a thermos flask with pieces of ice. Sent by air mail, they arrived in the laboratory within twenty-four hours and their temperature was found to be 0° C. For these specimens we are deeply grateful to Dr. C. E. Dolman and Dr. L. E. Ranta. The material from Ottawa was transported in the same way and for its collection we are indebted to Dr. C. A. Mitchell and Dr. G. D. W. Cameron.

Inoculation and Care of Ferrets

This was carried out as described by Hare and Yen (1938). In most instances the ferrets were sacrifised on the fifth or sixth day irrespective of the temperature response. If they responded by an increase in temperature a suspension of the turbinates and lungs was then transferred to other ferrets. These ferrets were allowed to survive and blood was drawn between the fourteenth and twenty-first day. Neutralization tests were then carried out with the serum in order to determine whether there had been a development of neutralizing antibody. Attempts were also made to transfer the virus from turbinates and the lungs of the first ferrets to mice with, on the whole, very little success. Only three strains out of twelve were so transferred.

Neutralization Tests

These were carried out by the method described by Francis et al (1937).

PR8 virus was used for the influenza A determinations and Lee virus for the influenza B. The virus was suspended in 20 per cent inactivated horse serum in physiological saline. The suspensions were all titrated before use and 1000 M.L.D. of PR8 virus and 100 M.L.D. of Lee employed in 20 per cent horse serum saline. The sera, after inactivation, were dispensed into tubes in such dilutions that the first tube contained undiluted serum, the second 1/5, the third 1/15, the fourth 1/45, and the fifth 1/135. An equal volume of virus suspension was then added, giving final dilutions of 1/2, 1/10, 1/30, 1/90 and 1/270. After mixture they were incubated at 37° C. for fifteen minutes and 0.05 cc. inoculated from each mixture into three mice. They were sacrifised on the tenth day. The end point was calculated as that titre which protected 50 per cent of the mice against death, according to the method of Reed and Muench (1938).

RESULTS

The only method by which it is possible to ascertain the immunity of the subject for influenza is by titration of the neutralizing antibody or the complement fixing antibody, the former being the more useful in this regard. It cannot be said that there is an absolute correlation between antibody level and susceptibility to the disease but the results of previous workers such as Rickard et al (1940) (1941) would suggest that this may be so. Titrations of the neutralizing antibody of different groups of persons living in Toronto are given below.

Antibody Level for Influenza A Virus of Sera taken in the Early Stages of Epidemics

Epidemics in which influenza A infection occurred appeared in Toronto in the early months of 1937 and 1939 (Hare and Riehm, 1941) and a third time in December 1940. Only a few persons were bled before that of 1937, but 22 persons were bled before that of 1939 and 54 persons in 1940. The titres of the sera of the two groups for influenza A virus are given in table I.

TABLE I

ANTIBODY LEVEL AT THE START OF TWO EPIDEMICS

Titre	Year			
	1939		1940	
>1/10	8	72.7%	33	88.8%
1/10-1/60	8		15	
<1/60	6		6	
Totals	22		54	

The average titres obtained were, in 1939 1/40.0 and in 1940 1/35.8 but the great majority had antibody in only relatively low titre, 72.7 per cent

and 88.8 per cent in the two years having titres up to and including 1/60. In their investigations in Westchester, Rickard et al (1940) found 96.4 per cent with titres of 1/63 and below.

Antibody Level before or during the Early Stages of Infection with Influenza A Virus

Sera withdrawn during the early stages of infection from 32 cases of influenza A which developed during the epidemics of 1937, 1939, and 1940, were tested. The results obtained are given in figure 1. From the great

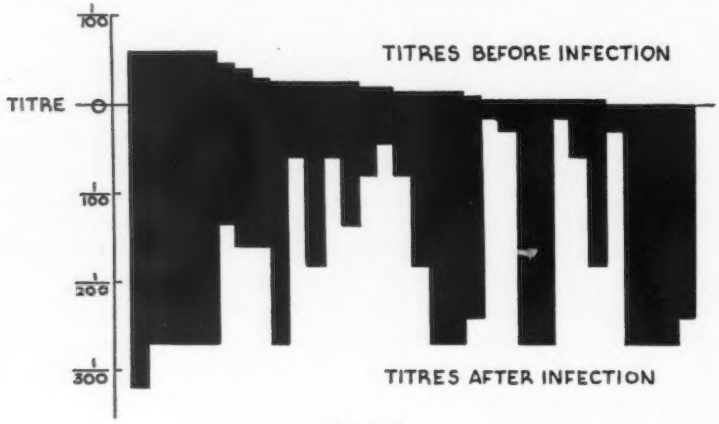

FIGURE I

ANTIBODY LEVELS BEFORE AND AFTER INFECTION WITH INFLUENZA A VIRUS

majority of these cases, virus was actually isolated. It will be observed that the highest titre in this group was 1/60 but the majority were much lower, the average titre being 1/20.5. This is below the average titre for the population just before the epidemics. Thus our results support those of previous workers and show that the general level of antibody in the early stages of clinical influenza tends to be low. Francis et al (1937), for instance, found an average titre of 1/22.4 with only two patients out of 41 with titres greater than 1/60 and Horsfall et al (1940) a mean titre of 1/11.

Except for the fact that influenza is probably rare in those with an antibody level over 1/60, we have insufficient data at our disposal to give attack rates at different antibody levels. Rickard et al (1940), however, did observe that persons with a titre below 1/4 had an attack rate of 13.6 per cent whereas in the group with titres from 1/16 to 1/63 it was only 1.7 per cent. Rickard, Horsfall, Hirst and Lennette (1941) obtained similar results.

Antibody Level after Infection

This information is also given in figure 1. The levels are, of course, much higher than before infection and it is of interest that no less than 75 per cent of the cases had titres of 1/60 and more, the average actually being

1/145.0. It can be assumed that these persons were all immune so that if there be connection between immunity and antibody level, the lowest safety level is probably in the neighbourhood of 1/60.

Antibody Level following Immunization

A group of 98 persons in these laboratories was given 1 cc. of the complex vaccine of Horsfall, Lennette and Rickard (1941) on December 12, 1940. On the same day cases of influenza A appeared in Toronto. The group was bled again on December 27, fourteen days later. Another group of 49 persons in the staff of the Laboratory of Hygiene, Ottawa, and the Animal Diseases Research Institute, Hull, P.Q., was given the vaccine on December 30 but as influenza had already made its appearance, the behaviour of this group is not referred to further.

Of the 98 persons in Toronto, 13 became infected during the fourteen days following the injection of the vaccine, leaving 85 who were unaffected. The antibody levels of 41 of these before and after the vaccine were determined and the results are given in figure II. Four had titres above 1/60 before and were therefore probably immune to begin with. The responses of the remaining 35 were variable, some responding well to the vaccine, others hardly at all. Although the average titre of the sera taken fourteen days after the injection was 1/78.7, only 18 of the 35 who had had titres of 1/60 and below before the vaccine, reached a titre of 1/60 or higher afterwards. In other words, it is probable that only about half the group were rendered immune by the vaccine

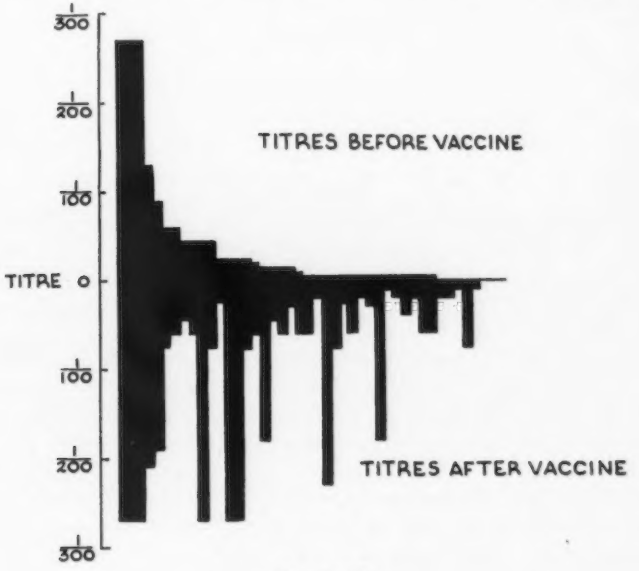

FIGURE II

ANTIBODY LEVELS BEFORE AND FOURTEEN DAYS AFTER ONE INJECTION OF COMPLEX INFLUENZA A VACCINE

and it is of some interest that in other investigations, notably those of Brown et al (1941), and Horsfall et al (1941), in which attack rates in an immunized population were determined, the rates were about half those in the control groups. Nevertheless, reduction of the attack rate by one half, or an increase in antibody to a "safe" level in only half the immunized population cannot be described as more than a partial success. A stronger vaccine, or possibly more doses, may well be necessary in order to obtain better results.

Another disadvantage of the vaccine as employed by us was the high probability that the immunity produced was only temporary. Ten of the group were bled a third time on April 30 and, as will be seen from figure III, in only three did the increase in antibody level persist, the rest exhibiting a marked fall in antibody level.

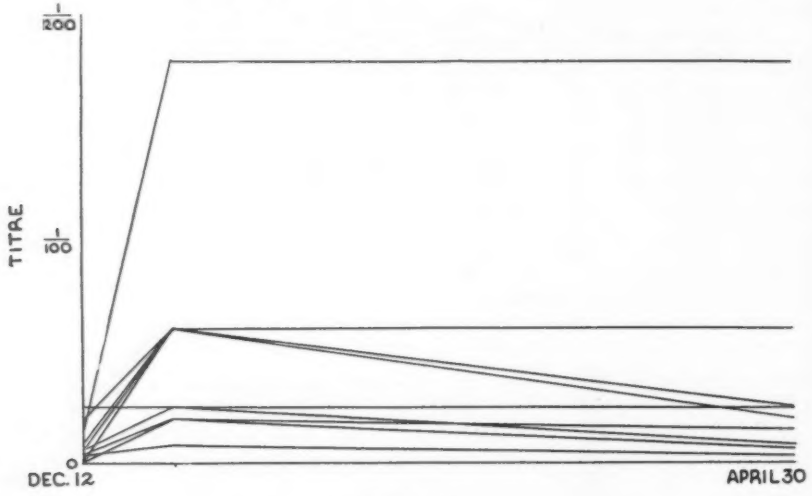

FIGURE III

SHOWING TENDENCY OF THE ANTIBODY LEVEL TO FALL FOLLOWING POST-INOCULATION RISE

The Occurrence of Influenza A and B in both Immunised and Unimmunized Groups in 1940

Immunized Group.—Because influenza appeared at the same time as the immunization procedures were carried out, the efficacy of the vaccine in protecting against infection could not be ascertained. But as far as possible, every case of nasopharyngeal infection in the immunized group was investigated.

These infections fall into two groups: those which occurred before and those after the fourteenth day, on which day all the immunized persons were bled a second time. There were 13 in the former and 21 in the latter. Of the 13 cases which occurred before the fourteenth day, 4 were probably cases of influenza A because virus was actually isolated from them. The diagnosis of the remaining 9 was in some doubt because virus was not isolated from any

of them despite efforts to do so, and any increase in antibody level which occurred following the illness may have been due to the vaccine. Nevertheless, 3 were afebrile with all the signs of colds and 2 were intercurrent exanthemata. The sera of all these cases were tested against B virus but there was no evidence of infection with this virus.

The infections which occurred after the fourteenth day are in a different category because serum taken on that day was in all cases available. This provided a base line for serological tests. This group was observed until March 31, during which time there were 21 infections. Serum was taken from all the cases three to five weeks after infection and was titrated, together with that taken on December 12 and December 27 with both A and B viruses, an increase of four-fold in the titre being taken as indicative of infection with one or other of these viruses. In addition, throat washings were obtained from the majority of the febrile cases. The results are given in table II. Only one case of influenza A was diagnosed, virus being isolated and a typical serological response obtained. Seven cases were diagnosed as influenza X because the symptoms were typical, but there was neither serological response to A or B virus nor clear evidence of virus infection in the ferret. In common with Lennette et al (1941), we observed, in several of these cases, evidence of a temperature response in the ferret but no definite evidence of a virus. Nine infections were typical colds, again without evidence of increase in immunity to either A or B viruses.

In the group of 49 individuals immunized at Ottawa there were 4 cases after the fourteenth day. Somewhat similar results were obtained, there being one case of influenza A and three cases of influenza X.

Unimmunized Group.—As many nasopharyngeal infections as possible in non-immunized persons were studied during the period November 1940, to March 1941. There were 19 in Toronto, 3 in Vancouver, and 7 from rural districts of Ontario. Most of these cases occurred during December and January. All were febrile and had the typical symptoms of influenza. Cases with the symptoms of common cold were intentionally not studied. The results are also given in table II. It will be seen that only half of these cases

TABLE II

DIAGNOSIS OF INFECTIONS DURING THE PERIOD DECEMBER 1940-MARCH 1941

Place	Number	Diagnosis				
		Influenza			Common Colds	Miscellaneous
		A	B	X		
Not immunized						
Vancouver...	3	3	0	0	0	0
Rural Ontario	7	7	0	0	0	0
Toronto.....	12	6	0	6	0	0
Immunized (after 14th day)						
Toronto.....	19	1	0	7	9	2
Ottawa.....	4	1	0	3	0	0

were due to influenza A, the remainder being listed as influenza X because no increase in antibody level for A or B virus could be detected.

It is apparent from this that although influenza A was causing infections in this community, a high proportion of the infections were not due to either A or to B virus. A similar result was obtained by Lennette et al (1941) with material obtained at the same time in the United States.

It is apparent from this that every case during epidemics should be investigated thoroughly in order to prove the identity of the infecting agent. Statistical studies alone may well be valueless.

DISCUSSION

If the assumption be made that there is a direct correlation between the level of neutralizing antibody and susceptibility to clinical infection with influenza A virus, the investigation reported in this paper would suggest that a high proportion of the normal population is susceptible to influenza A for about 90 per cent have an antibody level which is at or below the highest level before infection in persons who become infected. There is no reason to suppose that Toronto is unusual in this regard, similar findings being reported from other places. Attempts to raise this generally low level by means of the complex vaccine of Horsfall, Lennette and Rickard have not proved in all cases successful nor does the immunity produced by one dose of this vaccine persist. A stronger vaccine, and possibly more than one dose, is therefore required in order to bring about a rise in titre of as many as possible of those with initially low titres.

Perhaps the most serious objection to mass immunization with vaccines composed of one or other of the known influenza viruses is not so much the difficulty of producing adequate immunity but the fact that many influenzas, even during an epidemic, are due to other agents, the majority of which have not yet been identified. This first became apparent in the epidemic of 1939, added confirmation being obtained in that of 1940-41. The isolation and identification of these other agents is therefore a prime necessity before mass immunization can be seriously contemplated.

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Health Teaching in the Primary School*

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PUBLIC health workers often meet with undesirable mental attitudes in the population on questions relative to public health. For example, one might mention the opposition to milk pasteurization, the antagonism to quarantine regulations, the practice of self-diagnosis and self-medication, the confidence in bone-setters and quacks. Many other examples could be given were it necessary. Naturally, these attitudes are a result of insufficient knowledge, and are usually associated with improper living practices.

In the education of our children, this accounts for an important economic loss due to curtailed social work, impaired school service, and pernicious consequences for the present and future well-being of the pupils. We must put a stop to this waste of life and money. Such a mentality is the result mainly of defective education, and better health teaching would contribute in no small measure to change the situation for the better.

Health is taught to adults and to school children. Adult education should not be neglected, but it is difficult, often ineffective; I would venture to say that it is impossible to impress adults if we interfere with their personal interests. Such teaching can give only partial results, for although they may readily admit the value of hygiene, they can hardly be expected to change living habits that have stood for twenty, thirty or forty years.

Teaching children is much easier: their minds are highly receptive, and youth is the right time to acquire habits. We have an organization all ready for that training, the school, which eventually will reach the whole population.

The teaching of health should be an essential part of education. Naturally, by "education" one does not mean the acquisition of a certain amount of book knowledge, but the complete and ideal development of a child in all ways: moral, mental, physical, emotional and social. The above definition implies that health should not be thought of as a subject of instruction, but as a mode of living, just as religion is a mode of spiritual living.

There need be no examinations nor rewards following the learning of health. What could a written paper mean, when the child's behaviour has not been modified; and is not a healthful life a reward in itself? Health learning should be lively and enjoyable, and learning by experience should be substituted as much as possible for the old method of studying in books.

Briefly, the program aims to form habits in children, for a 24-hour-day health behaviour; then to impart enough knowledge to justify such practices; and finally to help develop mental attitudes that will guide them in their choice of the rules of life. The limits and the main lines of such a program

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tend to uniformity, continuity and progression in the whole course of studies; yet the teacher should take into consideration the individual needs of his pupils for his teaching, and not try to force into a rigid mould a number of children, no two of whom are alike.

Every child forms habits during his school life, and we should see to it that they be good ones. At this age, it is even possible to get him rid of a bad habit by the substitution of a good one. In the first grade, the pupil should train himself to be clean, to dress according to the weather, to take good care of his clothes, to maintain good posture, to control his emotions, and to maintain equilibrium, regularity and moderation in all his activities: meals, work, rest, play or sleep.

The teacher makes positive suggestions for such practices, motivating them properly, avoiding the ideas of danger, shame or fear, lest the child be made unduly health-conscious. A pupil should not be held responsible for a situation over which he has no control; but he should be complimented if he deserves it. Every opportunity is taken to utilize the natural tendencies of the child, his legitimate ambitions, and the subjects of special interest for his age. Certain routine procedures have a high educational value: let us mention the regular weighing and measuring, the morning inspection by the teacher, the school medical services, physical education, pauses for relaxation during school hours, the keeping of a health record for each child. All the above activities bear a definite influence on health education, and they will have a double value if they take place in a favourable environment. This does not mean only the sanitary conditions of the school buildings, but also, and above all, the moral atmosphere of good will, mutual confidence and co-operation between teachers, parents, pupils, health workers, and members of the school board.

Starting in the fourth or fifth grade, proper health instruction should be given, and to that end manuals of hygiene are necessary. Some are good and some are not. In the past, for the teaching of personal hygiene, the handbooks described all the body systems and organs in succession and explained for each one anatomy, physiology, pathology and hygiene. As a rule there was only one book, devoid of illustrations, and without any gradation whatever of the matter according to the mental age of the children.

Nowadays, to give this teaching in conformity with life situations, manuals describe the functions and activities of the body and mind, and so they deal with cleanliness, clothes, food, growth, work, rest, play, sleep and so forth. About the care of the eyes or ears for instance, essential instruction on their structure and function will be given only when the child is able to grasp it. The present state of our knowledge should never be laid down as final; children must be warned that science progresses continually, and that some accepted truths of today may be recognized as errors tomorrow.

Teaching need not proceed only from a manual and a teacher's explanations. Other means of instruction are available that are, I dare say, more effective, such as discussion, moving pictures, demonstrations and experiments, museums, field trips, investigations, dramas, and so on. Many

correlations, too, are possible between health and language, mathematics, arts, social and natural sciences. Projects and collective enterprises should be organized: they are team-work activities in which every child is assigned a task of finding or building something; they are an excellent means of developing personal initiative and responsibility, and the spirit of co-operation. Children are furnished with necessary material and references, but even then one must expect that they will make mistakes; nevertheless these will do them no harm, if stimulation is provided to overcome and rectify them.

It is now recognized that the teaching of health belongs to the classroom teacher, and that the public health workers should serve only as advisers. If educators are to become interested, they must be offered a well-planned program; and the only test of its value is the change it will bring about in the children's health behaviour.

The teachers need a manual to guide them in their teaching. The curriculum of our teacher-training institutions should be revised in order to prepare better health educators; and we should start the training of those already in service by summer courses and evening classes for the same purpose. A bulletin could bring to them up-to-date developments on the subject. The teacher's own health is of great importance to himself, to the protection of his pupils, and to serve as an example in his teaching: this point deserves attention and control by the authorities.

In the manuals for pupils, the subject is presented according to the principles of modern educational psychology: the teaching is positive, proceeding from things already known into new fields of learning, and it must be scientifically exact. There should be enough books for a satisfactory gradation of the matter for children of different grades; and they should be attractive and profusely illustrated. The program, the guide for the teacher, and the manuals for the pupils should be prepared jointly by hygienists and educators.

After several generations of school children have benefited from satisfactory health teaching, we shall begin to notice in our people favourable attitudes towards matters of health, instead of the indifferent or hostile ones of today, and that cannot but be a factor of progress. As a consequence of that teaching, we can look forward to the day when our morbidity and mortality rates will compare favourably with those of any other country.

A Fourth Outbreak of Staphylococcal Food Poisoning in Hamilton, Canada

(May, 1941)

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ON MAY 9, 1941, the Department of Health was notified by the Hamilton General Hospital that two adult male patients had been admitted, apparently suffering from food poisoning. The symptoms were severe vomiting, diarrhoea, cramps, and prostration. Epidemiological investigation revealed that both patients had had a meal in a local restaurant a few hours before the onset of the illness. Both had partaken of butterscotch pie. Two other cases were reported by a local physician as having occurred on the same day. Again the common article of diet was butterscotch pie, and the meals were taken at a branch of the restaurant which served the patients first reported.

Samples of the pie, and of the other foods eaten, were immediately secured from the restaurant concerned and taken to the City Laboratories for examination. All employees of the restaurant were interviewed and nose and throat swabs taken. Bacteriological examination of vomitus, butterscotch pie, and cultures from the nose of the restaurant pastry cook who made the pies showed the presence of closely similar strains of *Staphylococcus aureus*. The employee in question was required to undergo treatment and was forbidden to work in food establishments until swabs of nose and throat, taken at regular intervals, should demonstrate the disappearance of the organism. She was under treatment from July 24th to September 13th, 1941, and nose and throat cultures taken at weekly intervals were consistently negative. She was permitted to return to work but was instructed to have swabs taken at fortnightly intervals. A swab of the nose taken on September 24th was reported on September 25th to show again the presence of *Staphylococcus aureus*. She was thereupon instructed to cease work and to resume treatment and bacteriological examinations.

The laboratory investigation was carried out along the lines of the study of the outbreak of 1938, previously reported.[1] A study of the vomitus of one hospital patient, F. D., revealed the presence of *Staphylococcus aureus* (table I). A sample of the butterscotch pie and the tip of the pastry bag used

[1]Roberts, J., Deadman, W. J., and Elliott, F. J.: An Outbreak of Staphylococcal Food Poisoning, Canad. Pub. Health J., 1938, *29*:325.

TABLE I

BACTERIOLOGICAL EXAMINATION OF PATIENTS HOSPITALIZED

Culture Number	Name	Source	*Staphylococcus aureus*
2495	Patient F. D.	Faeces	Negative
2496	" "	Vomitus I	Positive
2496	" "	Vomitus II	Positive
2497	Patient A. P.	Vomitus I	Negative
2497	" "	Vomitus II	Negative
2498	" "	Faeces	Negative

in decorating the pie also showed the presence of this organism (table II). Examination of various other articles of diet consumed at the meal by the two hospital patients was negative. A sample of cocoanut pie from the branch restaurant which had been in the main restaurant showed also a culture of *Staphylococcus aureus*. A survey of the noses and throats of 19 employees of the main restaurant, and of 8 employees of the branch restaurant,

TABLE II

BACTERIOLOGICAL EXAMINATION OF FOOD

Culture Number	Food Items	*Staphylococcus aureus*
2499	Hamburg steak	Negative
2500	Butterscotch cream pie (*a*) Butterscotch cream pie (*b*)	Negative Positive
2501	Cream pie (on china plate) " " " " " " " " " " " " " " "	Negative Negative Negative Negative
2502	Clams in glass jar	Negative
2503	Clams (breaded) in paper bag	Negative
2504	Clams (in unopened tin)	Negative
2505	Milk (½ pt. bottle—unopened)	Negative
2506	Pastry bag tip	Positive
2823	Cocoanut cream pie (Branch restaurant) " " " " "	Positive Positive

gave positive results in the case of 16 of the personnel (table III). Pure cultures of the strains of *Staphylococcus aureus* isolated were forwarded to Mr. R. J. Wilson of the Department of Hygiene and Preventive Medicine, University of Toronto, for the kitten test and estimation of toxigenic properties. In his report he states: "It is evident that the suspicion of the baker as being the source of the infection was well founded, for the data in the accompanying report definitely incriminate her. The cultures from the pie, pastry bag tip, and the baker's nose, and the vomitus from one of the patients were identical in every regard and all gave a positive kitten test for staphylo-

coccal enterotoxin, completing the chain of evidence." Mr. Wilson's findings are presented in detail in a separate report.

TABLE III

BACTERIOLOGICAL EXAMINATION OF RESTAURANT PERSONNEL

MAIN RESTAURANT

Culture Number	Name	Employment	Source	*Staphylococcus aureus*
2507	Miss I. N.	waitress	nose	Positive
2508			throat	Positive
2509	Miss I. W.	waitress	nose	Positive
2510			throat	Positive
2511	Miss G. W.	waitress	nose	Positive
2512			throat	Positive
2513	Miss R. M.	cashier	nose	Positive
2514			throat	Negative
2515	Miss R. H.	assistant to baker	nose	Negative
2516			throat	Negative
2517	Miss M. R.	waitress	nose	Positive
2518			throat	Positive
2519	Miss C. B.	baker	nose	Positive
2520			throat	Negative
2521	Miss A. B.	waitress	nose	Negative
2522			throat	Negative
2523	Mr. J. Z.	chef	nose	Negative
2524			throat	Negative
2525	Mr. A. K.	chef	nose	Positive
2526			throat	Negative
2527	Mr. J. B.	dishwasher	nose	Negative
2528			throat	Positive
2529	Mr. S.	dishwasher	nose	Negative
2530			throat	Positive
2531	Mr. A. K.	dishwasher	nose	Positive
2532			throat	Positive
2533	Miss D. T.	waitress	nose	Negative
2534			throat	Negative
2535	Miss A. H.	waitress	nose	Negative
2536			throat	Negative
2537	Miss L. T.	waitress	nose	Negative
2538			throat	Negative
2539	Mr. N. F.	potato peeler	nose	Negative
2540			throat	Negative
2541	Mr. D. T.	meat cutter	nose	Negative
2542			throat	Positive
2543	Mr. J. B.	purchasing agent	nose	Negative
2544			throat	Negative

BRANCH RESTAURANT

Culture Number	Name	Employment	Source	*Staphylococcus aureus*
Day Shift				
2815	Mr. A. S.	vegetable peeler	nose	Negative
2816			throat	Negative
2817	Miss R. S.	waitress	nose	Positive
2818			throat	Negative
2819	Miss M. H.	waitress	nose	Positive
2820			throat	Negative
2821	Mr. C. E.	chef	nose	Negative
2822			throat	Negative
Night Shift				
2841	Mr. H. S.	dishwasher	nose	Negative
2842			throat	Negative
2843	Mr. N. D.	chef	nose	Positive
2844			throat	Negative
2845	Mr. J. P.	waiter	nose	Positive
2846			throat	Negative
2847	Mr. J. S.	waiter	nose	Positive
2848			throat	Negative

It would appear to be clearly established that this outbreak of food poisoning was due to the presence of a toxigenic *Staphylococcus aureus* in butterscotch pie, probably from the nose or throat of some of the employees showing positive cultures. Pastry fillings of this kind are the ideal culture medium for this organism, as has been amply proved.

Special Report on a Food-Poisoning Outbreak in Hamilton, Canada, May 1941

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IN May, 1941, a number of strains of staphylococci isolated in the course of the investigation of an outbreak of food-poisoning in Hamilton, Canada, were sent to this laboratory for examination. The data accumulated during the epidemiological investigation incriminated a butterscotch pie baked on the premises of the restaurant in which it was served, and the rapid onset of vomiting suggested that the staphylococcus was the etiological agent. The similarity of this to three former outbreaks of staphylococcal food-poisoning in Hamilton reported by Roberts et al in 1938 (1) and 1939 (2) was striking, and accordingly the same procedure was followed in the investigation. Cultures of staphylococci were obtained on bacteriological examination from the pie, the pastry-bag tip, and the vomitus of a patient. The noses and throats of all the employees of the restaurant were swabbed, and examined for staphylococci. The cultures were studied by the methods described by Wilson (3).

Table I shows the results of a study of the toxigenic characteristics of

TABLE I

STRAINS OF STAPHYLOCOCCI ISOLATED DURING THE INVESTIGATION OF AN OUTBREAK OF STAPHYLOCOCCAL FOOD-POISONING IN HAMILTON, CANADA, MAY, 1941

	Strain number	Source	Color	Haemolytic zones on sheep blood agar plates		Toxigenic characteristics			
				Primary	Secondary	α Haemolysin	β Haemolysin	Lh dose	Enterotoxin (kitten test)
1	2507	Throat, I. N., waitress	Golden	1.5–2.5 mm.	0	2048	512	0.08 cc.	
2	2508	Nose, I. N., waitress..	Golden	1.5–2.5 mm.	0	2048	512	0.08 cc.	
3	2509	Nose, I. W., waitress .	Golden	1.5–2.0 mm.	0	2048	256	0.08 cc.	
4	2510	Throat, I. W., waitress	Golden	1.5–2.0 mm.	0	2048	256	0.05 cc.	
5	2511	Throat, G. W.,waitress	Pale cream	2.0 mm.	0	2048	256	0.12 cc.	
6	2512	Nose, G. W., waitress.	Pale cream	2.0 mm.	0	1024	512	0.12 cc.	
7	2513	Throat, R. M., cashier.	Pale cream	1.0–2.0 mm.	0	2048	128	0.08 cc.	
8	2517	Nose, M. R., waitress.	Cream	2.0–3.0 mm.	0	4096	256	0.08 cc.	
9	2518	Throat, M. R., waitress	Cream	2.0–3.0 mm.	0	4096	512	0.08 cc.	
10	2525	Nose, A. K., chef.....	Cream	1.0–2.0 mm.	0	2048	512	0.08 cc.	
11	2528	Throat, J. B., dishw'hr.	Cream	2.0–3.0 mm.	0	4096	256	0.08 cc.	
12	2530	Throat, S., dishwasher	Cream	3.0 mm.	0	4096	512	0.08 cc.	
13	2531	Nose, Albert K., dh'wr	Cream	1.0–2.0 mm.	0	4096	128	0.05 cc.	
14	2532	Throat, Albert K., d'w.	Cream	1.0–3.0 mm.	0	1024	512	0.12 cc.	
15	2542	Throat, D. T., meat-cutter.....	Pale cream	3.0–4.0 mm.	0	2048	128	0.08 cc.	
16	2496–1*	Vomitus, F. D.,patient	Golden	1.0 mm.	1.0 mm.	64+	16	2.5 cc.	+
17	2496–2*	Vomitus, F. D.,patient	Golden	1.0 mm.	1.0 mm.	64+	16	2.5 cc.	+
18	2500 *	Butterscotch pie.....	Golden	1.0 mm.	1.0 mm.	64+	16+	2.0–2.5	+
19	2506 *	Pastry-bag tip.....	Golden	1.0 mm.	1.0 mm.	64+	16	2.5 cc.	+
20	2519 *	Nose, C. B., baker....	Golden	1.0 mm.	1.0 mm.	64+	8–16	2.5 cc.	+

*Only these strains were tested for enterotoxin by the kitten test.

the strains of staphylococci isolated. It is clearly evident that the cultures from the pie, the pastry-bag tip, and the vomitus of patient F.D. are identical in their toxigenic characteristics. The toxins elaborated by these several strains evoked vomiting in kittens, thus demonstrating the presence of enterotoxin in all the filtrates.

On examination of the toxic filtrates of the strains isolated from the noses and throats of the employees, it can be seen that the filtrate produced by the strain isolated from the nose of Miss C.B. is identical with those produced by the strains isolated from the butterscotch pie, pastry-bag tip, and vomitus of patient F.D. The filtrate from this strain, when injected intraperitoneally into a kitten, evoked violent vomiting. Miss C.B. was the baker at the restaurant, and prepared the pie which was incriminated.

DISCUSSION

This is the fourth outbreak occurring in Hamilton, Canada, in which the investigation has been thorough both in the field and in the laboratory; and indeed the significance of the laboratory findings would be lost were the epidemiological studies not exhaustive and accurate. There have been many outbreaks come to one's notice in the past several years that have not lent themselves to investigation because of insufficient field work, lack of food samples, and incomplete case histories. The staphylococcus has been considered the etiological agent only on presumptive evidence such as the type of food eaten, the onset of violent vomiting within one and a half to four hours after eating, followed by diarrhoea, prostration and in some instances severe dehydration, with prompt and complete recovery with or without symptomatic treatment.

It is of some significance then, that in these few outbreaks which have been thoroughly investigated and in which the complete succession of events has been established, the origin of the infection has been found in every case to be the nose and throat of the baker or the person responsible for the preparation of the cream filler. This has been clearly demonstrated in four out of four outbreaks investigated, and since the percentage of outbreaks investigated is small, it would seem to be more than mere coincidence. It is of further significance that in the course of investigation of two different outbreaks, 72.7 per cent of employees in one bakery and 58.0 per cent of employees in one restaurant showed the presence of haemolytic staphylococci in the nose or throat. Since Kupchick (4) has found that 47.4 per cent of staphylococci isolated from various sources are capable of producing enterotoxin, the hazard of food contamination by those preparing it becomes very great. And if conditions are such that subsequent multiplication of the micro-organisms is not prevented, the most sanitary of bakeshops or restaurants is exposed to the risk of distributing products that might ultimately cause an outbreak of food poisoning.

Another point that has been demonstrated in the former outbreaks is that of the existence of "carriers" (2, 3). It has been clearly shown that an

individual may harbour the same strain in his nose and throat for months and years with no clinical evidence of infection. These persons cannot be considered in the same class as typhoid carriers, yet they are a menace, and should not be allowed to prepare foods. But with a high percentage of the population harbouring staphylococci in the nose and throat, of which strains about 50 per cent are potentially capable of producing enterotoxin, the chances of replacing the employee with another just as much a menace are fairly high. Thus the employee is being discriminated against rather unfairly. The problem does not lend itself to ready solution, but this much is clear. The prevention of contamination is almost impossible. The hazard may be minimized by teaching bakers and cooks hygienic methods of handling cream fillers and other foods but not completely or nearly completely removed. The attack must be directed towards the proper handling of the fillers and finished goods during and after preparation in order to inhibit multiplication of the micro-organisms with consequent production of toxin. This can only be done by adequate cooking and prompt and effective refrigeration after the product has been cooked or completed. These recommendations have been outlined in detail elsewhere.

One other point must be emphasized. It has been clearly shown that bovine strains are capable of producing entertoxin (5, 6, 7,) and several outbreaks have been traced to the consumption of raw milk (8, 9). This hazard is minimized in those localities where pasteurization is enforced, but one must bear in mind that milk can be infected by the consumer after it has been pasteurized, and unless it is used promptly or stored properly, pasteurization may give a false sense of security.

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VACCINATION AGAINST INFLUENZA

THE paper by Hare, Auger and McClelland published in this issue is a record of investigations which have been made in Toronto on the efficacy of the complex vaccine of Horsfall. This it will be recalled consists of emulsified embryonic tissue from eggs infected with both influenza A virus and the virus of canine distemper. This was adopted because it had previously been shown that a vaccine made from lungs of ferrets infected with both influenza and distemper viruses would confer immunity on ferrets whereas a vaccine made from lungs infected with influenza virus only had little or no protective action. Because of this it was assumed that a complex vaccine made by growth of the two viruses in hen's eggs would confer more marked immunity in human beings than the simple vaccine made from influenza virus alone. Serological tests suggested that this might be so, for a more marked response was obtained in human beings following one dose than with any other vaccine.

The vaccine was widely distributed in the autumn of 1940 by the International Health Division of the Rockefeller Foundation and thousands of persons were vaccinated with it. During the subsequent months an epidemic appeared in which many of the cases, but by no means all, were shown to be due to influenza A. It was found however that the vaccinated population was, even in the most favourable light, little better off than the non-vaccinated, a reduction in the case incidence of 50 per cent being the best that could be obtained. Other workers obtained no evidence of protection, and still others showed that although some protection was obtained it was no better than that following one dose of a single vaccine in which distemper virus had had no share.

In the Toronto study no attempt was made to ascertain the ability of the vaccine to confer clinical protection. Instead, the antibody level of the vaccinated group was compared with that of the population generally and of patients before or after influenza. This shows clearly that following one dose of the vaccine the antibody of only about 50 per cent of the non-vaccinated population reaches that level found in persons who are immune to the disease. But the authors also point out that even during an epidemic there may be many cases from which influenza A or B cannot be isolated. This is a big stumbling block to the use of vaccine for any mass immunization procedures. For until the agents respon-

sible for these other infections have been isolated, identified, and incorporated in vaccines, there is little hope of achieving any marked reduction in the incidence of this disease.

OUR RESPONSIBILITY

IN the January issue of the American Journal of Public Health, Dr. Thomas Parran, Surgeon General of the United States Public Health Service, conveys a timely message to all public health workers. It is a privilege to reprint this statement by Dr. Parran.

FOR 1942

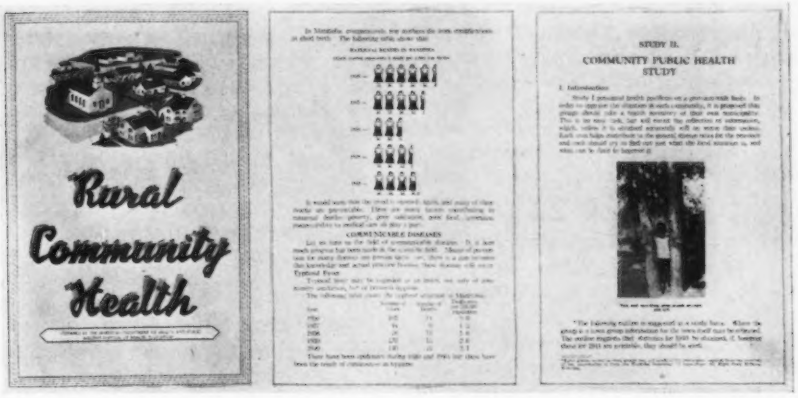
The United Nations fighting for freedom face a New Year begun in sorrow because it brings widespread destruction of human life rather than the continuing effort to save life and lessen suffering. Important as has been the task of public health workers in the past, it is of transcendant urgency now in the battles to defend our freedom. Not only must we hold the lines against preventable disease in the population sustaining the armed forces and producing the essentials of war; we must also translate scientific fact into positive action for three-thirds of our people in order to raise the level of strength, endurance and morale for the grim work ahead. Let us reappraise our own efforts, having the patriotism to discard from our plans whatever contributes little to national needs, and the courage to move ahead boldly where we can add to national strength.

Ours is the responsibility for leading the fight against the weakness from within which impedes attack upon the enemy without.

PUBLIC HEALTH EDUCATION

"Rural Community Health"

RURAL COMMUNITY HEALTH was prepared by the Division of Health Education of the Department of Health and Public Welfare, Manitoba, under the direction of Dr. A. Marguerite Swan, in response to a request from the Manitoba Federation of Agriculture, an organization which



"RURAL COMMUNITY HEALTH"

immunization that has been carried on, and the number of cases of tuberculosis indicates to a certain extent whether or not any health education has been done.

The first study ends by showing the amount of money spent by the Department of Health and Public Welfare and how it is allocated to the different divisions, and that only nine per cent of the total budget is spent on prevention of disease.

The second part of the booklet is a community survey. The health situation in the Dominion and in the Province having been pointed out, it is drawn to the attention of the groups that each community is responsible for some of the illness and study groups are urged to conduct a local survey. This survey includes: (1) a background of general information, such as social status, economic status, and particulars of other activities; (2) a health study in the community. The members of the group are asked to list the number of cases and deaths from diphtheria, typhoid fever, and tuberculosis in their own community during the past five years. They study water supply, sewage disposal, and milk supply. The number of maternal and in-

conducts study groups of many types in rural Manitoba. The other subjects under consideration include soil conservation, livestock marketing, poultry marketing, credit unions, health, and other subjects of interest to farming communities.

The book is divided into three parts. The first deals with the health problem in Canada as a whole, very briefly, and some of the outstanding problems in Manitoba in particular. Statistics are inserted to indicate maternal deaths, infant deaths, and deaths from certain communicable diseases. These are all illustrated by means of a series of isotype illustrations. In the field of communicable disease, typhoid fever, diphtheria, and tuberculosis are studied in some detail. These diseases were chosen for different reasons. Typhoid fever gives an index of community sanitation, diphtheria the amount of

fant deaths must be recorded. The number of immunizations and the age of the children immunized, as well as the number done, are stressed. School health is also discussed and group members asked to make a study of their own community in this regard.

The third part deals with health problems in rural Manitoba. Since there are seventeen "municipal doctors" in the province, this system of medical care and its cost is described in some detail, and both the advantages and disadvantages of such a system are pointed out. A second type of set-up for community health is also described, that of a health unit. In Manitoba at the present time there are no full-time rural health units. Here again cost is given and advantages, from a public health viewpoint particularly, are stressed.

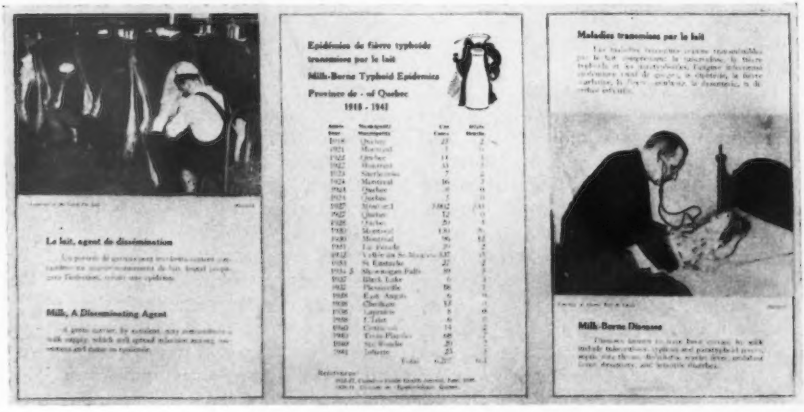
The booklet ends with a list of reference material obtainable from the Department of Health and Public Welfare Library.

Although it was designed for rural groups, the booklet could easily be adapted for councils of social agencies in cities.

"Le Lait Sain"—"Safe Milk"

To PROVIDE information concerning safe milk, its relation to public health, and the points to be observed in selecting a milk supply for the home, the Shefford County Health Unit, with headquarters at Granby, Quebec, recently issued a twenty-page booklet, LE LAIT SAIN. It is printed in French and English and contains numerous illustrations.

Opening with a short statement on the food value of milk, the booklet goes on to explain what contagious diseases are and how they may be spread by milk. Impressive evidence of the necessity for pasteurization is offered by the inclusion of a list of cases and deaths from milk-borne typhoid-fever epidemics in the Province during the years 1918 to 1941—a total of 6205 cases and 661 deaths. Pictures of tombstones add grim emphasis to the state ent that in Canada in the past twenty-nine years there have been ninety-four milk-borne epidemics involving 9594 cases and causing at least 718 deaths. Under the heading "Making Milk Safe" a large thermometer displays the correct temperature for pasteurization. The interior of a pasteurizing room is also shown and the laboratory test to determine the efficacy of pasteurization is pictured. Reference is made to the record of the City of Toronto, in which there has not been a single milk-borne epi-


Le lait, agent de dissémination
Milk, A Disseminating Agent
Epidémies de fièvre typhoïde transmises par le lait
Milk-Borne Typhoid Epidemics
Province de - of Quebec
1918 - 1941
Maladies transmises par le lait
Milk-Borne Diseases

"LE LAIT SAIN"—"SAFE MILK"

demic since general pasteurization was adopted in 1915. Concise statements from such authorities as the Health Organisation of the League of Nations, the American Medical Association, the Canadian Medical Association, and the Canadian Public Health Association sum up the arguments for the necessity of pasteurization. Finally, the reader is urged to use pasteurized milk: "The one and only aim of pasteurization is to take away from milk the danger of transmitting disease. Do not wait to be involved in a terrible epidemic. Protect your family by using only pasteurized milk."

Dr. Jules Gilbert, medical officer of the Shefford unit, deserves to be congratulated on this booklet, which shows that effective material for health education can be devised by the local health department serving a rural population as well as by provincial and municipal departments of health, with their immeasurably greater facilities. In its publication he had the assistance of the Kiwanis Club and the Junior Board of Trade of Granby.

BOOKS AND REPORTS

Influence of a Public Health Program on a Rural Community. *By W. Frank Walker and Carolina R. Randolph. New York: The Commonwealth Fund, 1940. 106 pages. 25 cents.*

THIS booklet—which is really an extension of two previous reports of the Commonwealth Fund, the first by Dr. H. S. Mustard, 1930, and the second by Dr. W. Frank Walker in 1935—records the experience of a full-time public health program maintained for fifteen years (1924-38) in Rutherford County, Tennessee. As a result the program has been evaluated as an indispensable service to the community and a great aid in the efficient training of public health personnel.

The accomplishments of the program are indicated in the downward trend of the general mortality rate, the striking decline in the typhoid fever mortality rate, the reduction in the "risk of reproduction" (i.e. maternal deaths, stillbirths and neonatal deaths), and in the decrease in deaths from diarrhoea and enteritis under two years of age. The comparison of infant, maternal and communicable disease mortality rates for Rutherford County with those for four adjoining unorganized counties and for the State of Tennessee reveals the favourable position occupied by Rutherford County. These reductions have been influenced by a full-time county health department organized in 1924 and a community hospital in 1927. The department consists of a health officer, a full-time medical assistant, a supervising nurse, an assistant supervisor, five staff nurses, a sanitary officer and two clerks; it has a budget of approximately $34,000 or $1.05 per caput.

The policy of the department is to vaccinate against smallpox every four years and against typhoid fever every three years. Scarlet fever, alone of the communicable diseases, has shown a definite increase in morbidity and mortality and constitutes an important and urgent problem. In spite of a vigorous campaign against diphtheria among pre-school and school children, the rate of decline in neighbouring counties without a health service has *apparently* been more rapid than in Rutherford County. It appears to the reviewer, however, that if Chart 5 were plotted on semi-logarithmic paper, the true picture would be seen.

The progress achieved and the stability attained are summarized in the scores made for activities and services in the appraisal form of the American Public Health Association.

This county has been utilized by Vanderbilt University for the instruc-

tion of senior medical students and for the training of nurses, as well as for post-graduate training of medical officers, public health nurses and sanitary inspectors.

This valuable report should be studied by directors of rural health units as a model of public health activities and their proper evaluation.

J. Wyllie

Your Teeth—Their Past, Present and Probable Future. *By Peter J. Brekhus. Minneapolis: The University of Minnesota Press, 1941. 255 pages, 31 plates and 20 figures. $2.50.*

THIS is a timely publication especially as one of the principal causes for selective service rejections in the U.S.A. is defective or deficient teeth. (The dental requirement for Army training is three pairs of biting teeth and three pairs of chewing teeth.) Dental caries and pyorrhoea alveolaris are two great scourges which present a challenge to the dental profession and public health authorities. The main thesis of the book is that dental decay among civilized human beings can be prevented by proper dental care particularly during childhood.

Evidence is produced to show that civilization is the underlying cause of dental deterioration. The published studies, by various investigators, on the teeth of primitive races indicate that the incidence of dental irregularities and of dental decay increases as these uncivilized races come into closer contact with white civilization.

The author, like a scientific iconoclast, questions most of the accepted views regarding the occurrence and prevention of tooth decay. Athletes' teeth were found to be no better than those of the average university student and yet the opinion is commonly held that good *dental* health is an accompaniment of good *general* health. Doubt is cast on the popular belief that pregnancy increases the susceptibility to dental caries. Both tooth-brushes and vitamins are apparently failing to save our teeth, for caries is more prevalent today than it was before these so-called remedies came into vogue.

In an interesting chapter entitled "Caries and Pyorrhoea", the rival theories of the etiology of dental caries are enumerated and the principal views discussed—bacterial, nutritional, poor inheritance and defective tooth structure. Very little proof has been brought forward regarding the effects of the various dietary elements on human dental conditions, but there is considerable evidence that excessive sugar remaining in the environment of the teeth stimulates the production of caries. The conclusion of the University of Michigan workers is quoted, viz., the occurrence and degree of activity of dental caries is associated with the interacting factors of tooth structure, virulence of the aciduric bacteria and oral hygiene. Pyorrhoea, like caries, has had a long history of research and seems to defy all efforts at prevention.

A study of the loss of teeth from various causes shows that the number of teeth decreases with age until at 70 only about 30 per cent of the teeth remain in the mouth of the average man and only about 20 per cent in that of the average woman. The loss of teeth from caries is most common between 10 and 20 years of age, and half of all the teeth are generally lost by the age of 40.

Although we are ignorant of the real cause of dental caries and of effective methods for preventing the appalling loss of teeth, preventive dentistry has, as its most vital function, the early filling of the *small* cavities in children's teeth. This prevents infection of the tooth pulps and eliminates the need for extractions. The establishment of school dental clinics in New Zealand in 1921 has resulted in a progressive decline in the number of extractions necessitated by advanced caries. A strong plea is

made for an organized plan enabling the prompt recognition and treatment of the small cavities in children's teeth throughout the U.S.A. and other countries. Sweden has shown the way by establishing a national dental service.

Dr. Brekhus is to be complimented on writing an interesting, popular yet scientific book for the dentist, physician, and layman.

J. Wyllie

Orientation in School Health. *By Clair V. Langton. New York: Harper & Brothers, 1941. 680 pages. $3.00.*

"THIS book was written in response to an increasing demand for information in the field of school health that has not been available in a form understandable by many of the public school personnel." It is divided into four parts. Part I gives an excellent summary of the factors concerned in the prevention and control of communicable diseases and points out the necessity and importance of a school health service and shows the part the teacher plays in it. Part II is devoted to a description of the school, its sanitation and environment. Part III, a most valuable section of the book, deals with the hygiene of the school child under the headings: growth and development, nutrition and malnutrition, oral hygiene and hygiene of the eye, ear, nose and throat, and tuberculosis. Part IV deals with the health of the teacher and its importance in regard to the physical and mental health of the pupils. The book ends with a section on safety education.

"Orientation in School Health" should prove to be of special value to high school teachers and should certainly find a place in the libraries of teacher-training institutions.

A. Marguerite Swan

Until the Doctor Comes. *By James A. Dolce. Washington: Federal Security Agency, United States Public Health Service. 60 pages. 10 cents. (100 copies $7.50.)*

THIS is a sixty-page booklet printed in bold type and illustrated with pictograph drawings, on a subject which might be termed "first aid". Simple procedures in the care of fractures, shock, burns, drowning, poisoning, etc., are described and illustrated. It is an excellent publication for groups studying first aid and because of its clear style could be adapted to any age group. It is of particular value at the present time when so many are interested in various types of health education.

The only criticism that might be levelled at the publication is that there is nothing in it about accident prevention, and though it does not have this angle of the problem as its main purpose, there should have been some mention of the fact that accidents are not necessarily inevitable.

A. Marguerite Swan

PUBLIC HEALTH NURSING

REFRESHER COURSE IN INDUSTRIAL NURSING

A REFRESHER course in industrial nursing arranged by the School of Nursing, University of Toronto, the week of October 27, 1941, was particularly timely. The war has given a new impetus to this branch of nursing which is, at present, assuming a vital role in our country's line of defence. It is interesting to note that the recognition of our opportunity for national service through industrial nursing, as well as our need for more knowledge and better preparation in this field, came from the official nursing body. The Registered Nurses Association of Ontario, at their annual meeting in 1941, decided to request this refresher course. The large enrolment of 119 was evidence of the desire on the part of the profession for just such assistance.

The program was well rounded and the various aspects of industrial nursing were ably presented by specialists in their respective fields. The program included:

1. The history and development of industrial hygiene, by Dr. J. G. Cunningham, Director, Division of Industrial Hygiene, Department of Health, Ontario.

2. The medical program in industry, by Dr. F. Cruikshank, Medical Director, National Steel Car, Malton, Ontario, and Dr. O. A. Cannon, Medical Director, Steel Company of Canada, Hamilton, Ontario.

3. Relationship within industry, with emphasis on the point of management, by Dr. W. H. Cantelon, Vice-President and General Manager, Auto Specialties Manufacturing Co., Ltd., Windsor, Ontario, and Mr. J. S. Willis, Personnel Manager, Canada Packers Ltd.

4. Psychology in industry, by Dr. K. S. Bernhardt, Assistant Professor of Psychology, University of Toronto.

5. First aid and the treatment of surgical emergencies, by Dr. J. H. Couch, Department of Surgery, University of Toronto, and Dr. R. Hare, Research Associate, Connaught Laboratories.

6. Principles of accepted public health practice, as applied to the industrial nursing program, by Miss Florence H. M. Emory, Associate Director, School of Nursing, University of Toronto.

7. The preparation and the practice of the nurse in industry, by Miss Ruth M. Scott, Consultant Nurse, Bureau of Public Health Nursing, Indiana State Board of Health, Indianapolis, Indiana.

Two interesting visits were arranged to the General Motors Plant, Oshawa, Ontario, and to the Defence Industries Limited, Pickering, Ontario.

Two round-table discussions on the various aspects and problems in industrial nursing were conducted by Miss Edna Moore, Chief Nurse, Ontario Department of Health, and Miss Muriel Mackay, Ontario Hydro Electric Commission. Valuable contributions were made by nurses serving in this field throughout the provinces.

The refresher course was a stimulating and helpful experience for all, whether engaged in industrial nursing, or in any of the allied fields. One came away with a fresh vision of the part each branch of nursing may play in the health program of our country, and how all may be integrated to form a complete service. A challenge was presented to the nursing profession to give leadership in establishing standards of preparation and practice in this, their newest field, industrial nursing.—*Ella Grant, Supervisor, Victorian Order of Nurses, Toronto.*

CURRENT HEALTH LITERATURE

Combined Active and Passive Immunization against Diphtheria. I. Studies of Antitoxin Response in Normal Students

THIS paper goes a long way towards settling a controversial issue and correcting false impressions in regard to combined active and passive immunization in humans. An extensive review of previous work on the subject is included and does much to explain the delay in reaching accurate conclusions. The experimental work in this study was carried out on students ranging in age from fourteen to twenty-two years, selection being made by means of Schick testing and antitoxin titration so that only those were included who had less than 1/1000 unit of antitoxin at the time of the first inoculation.

One group of 148 such persons received 0.1 cc. of alum precipitated toxoid (A.P.T.) followed by 0.3 cc. of A.P.T. four weeks later. A second group of 131 students received 0.1 cc. of A.P.T. into one arm and 350 to 500 units of diphtheria antitoxin simultaneously in the other arm, and 0.3 cc. of A.P.T. four weeks later. Both groups were re-bled prior to the second dose of A.P.T. and again approximately eight weeks later, at which time a final Schick test was carried out.

Antitoxin development following the first inoculation was slight in both groups. After the second injection of A.P.T., antitoxin developed more rapidly and in rather greater quantity in the first group than in the second. This difference was marked at the end of eight weeks but much less so at the end of twelve weeks. The Schick conversion rate in the two groups eight to twelve weeks after the second injection was very similar, being 95.7 and 90.5 per cent respectively.

Under the conditions of this experiment it was concluded that simultaneous administration of diphtheria antitoxin with the first dose of A.P.T. led to a delay and slight reduction in the development of antitoxin but that the final degree of immunity was not much inferior to that following active immunization alone.

A. W. Downe and others, Brit. M. J., 1941, Nov. 22, p. 717.

Combined Active and Passive Immunization against Diphtheria. II. Control of Epidemics in the Field

UTILIZATION of the information described in the first paper of this series in controlling seven outbreaks of diphtheria in residential and non-residential schools is described. The method consisted essentially of immediate combined active and passive immunization of all exposed to risk upon the appearance of the disease and detection and segregation of carriers until two weeks after the second immunizing dose. Carriers were immunized in the same way as the other children while newcomers were immunized before entering the school or kept segregated until immunized. Schick testing was included in the scheme at first but was dropped because of the high proportion (75 to 90 per cent) of susceptibles and the delay involved.

A population of about 1500 was at risk in these seven outbreaks, all of which terminated immediately upon the application of this technique. Five cases of diphtheria occurred after the campaign started but in none of the five had the full series of injections been given.

F. Fulton and others, Brit. M. J., 1941, Nov. 29, p. 760.

Fatigue after Skilled Work

THIS is a review of a lecture on fatigue following highly skilled work, which was delivered before the Royal Society on May 29, 1941, by Professor F. C. Bartlett.

In order to understand the character and causation of such fatigue, the lecturer stated that the first need was for the discovery of more relevant and experimentally controlled facts. Previous investigators had attempted to study this form of fatigue by methods very similar to ones used successfully in the study of simple muscular fatigue. For example, they chose elementary operations usually considered to require some "mental effort" as, for example, easy calculations etc.; repeated these operations over and over for long periods and then tried to express the resulting fatigue in terms of diminution in quantity and quality of the work done. Dr. Bartlett showed why such methods of investigation were of no value in studying fatigue after highly skilled work. Routine repetition of simple actions is not characteristic of any highly skilled work. Such work involves operations which are marked by complex co-ordinated and accurately timed activities.

After explaining that it was possible to develop fully controlled experimental situations which would serve as correct methods of studying this condition, Professor Bartlett went on to describe in detail the picture of fatigue which resulted. This included such symptoms as the following:

Unwitting deterioration of the "standards" accepted and followed by the central nervous system.

A marked change in the effect of certain "distracting" or additional stimuli.

Sensations of bodily origin become more pressing and insistent and affect the performance in ways peculiar to the tired operator.

A tremendous growth of irritability.

In conclusion, Professor Bartlett discussed the light thrown by this picture upon the relation of high-level central nervous functions to simpler neuromuscular mechanisms.

Brit. Med. J., 1941, June 7, p. 867.

Recording Sickness

In any successful factory organization today the various departments utilize every possible aid to efficiency. In the welfare department, statistics are of very great importance. Their value is particularly evident where the health of employees is concerned. An efficient system of recording absences through sickness gives the welfare officer of any particular large industrial unit a clear statement of the health of the unit at any time. In this article the author, who is the welfare organizer in a large group of factories engaged over a wide field of production, gives a brief outline of the methods for recording sickness which have been adopted in that organization. He discusses the duties of the sickness clerk in each factory, the type of monthly report form sent from each factory to the welfare department of the organization and the compiling of the information when received in the welfare department. It is pointed out that in this plan the unit is the factory and the periodical tables prepared show comparative figures for the entire group. Individual cases, however, can can be singled out for attention without difficulty. A study of such records in any organization will indicate conditions prevailing in certain factories which must not be ignored.

D. S. Fleming, Indust. Welfare, 1941, June, p. 122.

TRANSACTIONS

of the

EIGHTH INSTITUTE ON PUBLIC HEALTH EDUCATION

HELD AT ATLANTIC CITY, N.J.

OCTOBER 11-14, 1941

in connection with the

70TH ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

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Facts About a Public Health Problem

THE following cardinal principles govern the control—and, let it be hoped, the eventual eradiction—of syphilis:

1. Prompt recognition of syphilis is vital. Today, no one need remain in doubt as to whether or not he has syphilis. No one should be fearful of seeking medical advice about syphilis. The disease is contagious and can be contracted innocently.

If there is the slightest suspicion that syphilis has been contracted, action should be taken **immediately.** A thorough medical check-up, including a blood test and often a microscopic examination, will reveal the truth.

Early symptoms usually disappear whether treated or not. So, many a victim is deceived into neglecting medical attention while the disease slowly entrenches itself in one or more of the vital organs. Then, sometimes years after the initial attack has been forgotten, **syphilis strikes!**

2. Syphilis can be cured—but only by skilful treatment. Above all, avoid self-treatment, non-professional treatment, or quack doctors. The guidance of a reputable physician is the first dependable step toward real cure.

Proper treatment, in spite of research that promises to shorten the period, still consists of a systematic series of injections given by a competent doctor, extending over a period of a year or sometimes more.

3. Congenital syphilis can be prevented. A blood test will indicate whether or not an expectant mother has syphilis. If the test is positive, she can take advantage of the almost certain protection medical science offers her baby. Treatment **before birth** is vastly more effective than treatment after the child is born.

In progressive communities throughout the country, examinations, blood tests, and treatments are available. Infected persons who can afford private care may go to their own physicians, or to physicians recommended by the health department or by a general hospital. Persons unable to pay for treatment may find a free clinic by applying to the health department.

If you would like additional information about syphilis—information which will enable you to help your community solve this important public health problem—send for the free Metropolitan booklet, "Let's Black Out Syphilis." Address Dept. 2-J-42.

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